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ABSTRACT

This document contains a total of 57 welcoming speeches, theme addresses, seminar and workshop papers, and poster sessions that were presented at a conference on technological education and national development. The papers explore the ways technology and technological advances have both necessitated and enabled changes in the way education is designed and delivered. The following are among the themes addressed in the individual papers: rival views of technology and their impact on education; the learning needs of older adults using information technologies; entrepreneurship education; lifelong learning on the World Wide Web; issues

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faced by polytechnics and institutes of technology as they respond to the challenges of Internet technologies and new media; working knowledge; flexible delivery; strategies for teaching technical students to be critical; development of curricula incorporating "hands-on" experience and interaction with industry; a framework for open, flexible, and distributed learning; models of online teaching; the transition from secondary to university education; digital curriculum databases; use of technology to foster authentic communication for second language students; labor and education dilemmas facing the Arab Gulf States; the future of women's colleges; universal education; English for workplace purposes; empathy as a paradoxical key to successful human learning futures; economic education; and funding problems of technical education in developing countries. Many papers include substantial bibliographies. (MN)

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TEND 2000

# Crossroads of the New Millennium

## OPENING ADDRESS

Prepared and Presented

By

**HE Sheikh Nahayan Mabarak Al Nahayan**

**Chancellor of Higher Colleges Of Technology**

**PATRON, TEND 2000**

Saturday 8 April, 2000

Your Excellencies, Esteemed guests, Conference participants, Ladies and gentlemen: Good morning.

I am delighted to welcome you to the United Arab Emirates. As Chancellor of the Higher Colleges of Technology, I am especially pleased to acknowledge the role of the Higher Colleges in planning and organising this important conference.

The United Arab Emirates, along with its capital city of Abu Dhabi, provide an ideal venue for this conference, since our country has long been strongly committed to the benefits of education. His Highness the President, Sheikh Zayed bin Sultan Al-Nahayan, has identified excellence and relevance in education as an important part of the foundation of our national efforts. It is quite clear that our progress as a country and our active participation in the global economy depend on the wise and efficient use of our educational resources.

During your stay with us, I invite you to observe our achievements in education and training. For I believe that you will find, within our country, a unique commitment to educational development that will enable us to meet the challenges of the twenty-first century.

So, as we celebrate this new century and the new millennium, we cannot help but reflect on the past and look forward to the future. The year 2000 promises a renewal of the spirit that has energised the link of education to economic development and the acceptance of information technology as the key to effective participation in the global economy. Your conference provides a context for discussing many of the important issues that will determine the future of technological education. Therefore, my remarks to you today will reiterate my country's determination not only to adjust to the demands of new developments in technological education, but to lead in its implementation.

As all of you know, globalisation, economic restructuring and information technology are radically influencing the way we live and work. Today, technological change is not only rapid but spasmodic. It overwhelms us with unforeseen possibilities, especially in the field of education. In addition, global economic competition and the corresponding need to keep our work force up to date has placed great demands on the way we deliver training and the way we use our resources. Indeed, these technological forces are changing forever the way we learn and the way we work. No longer can we afford to be complacent before this onslaught of change, for our survival will depend upon how readily we absorb new knowledge and how quickly we develop requisite strategies for sharing and using this knowledge.

Our challenge, then, as we enter the twenty-first century, is how to use knowledge creatively, prudently and efficiently while, at the same time, coping with a rapidly changing global economy. It is now abundantly clear that if educational institutions do not keep up with this ever-expanding information technology, they will cease to survive as legitimate centres of learning. For learning in the twenty-first century must be eclectic; it must enable the learner to see meaningful relationships between different branches of knowledge. It must also be perpetual and self-renewing, allowing the learner more freedom to explore question, and create. Moreover, and especially in the area of technological education, the learner should be able to measure what he or she has learned. Perhaps the most important and far-reaching consequence of this new paradigm is the need for education to become more competency based. This means that students should be able to demonstrate real-world competency in their chosen area of knowledge before they are awarded diplomas or degrees. Our challenge as educators, then, will be to devise more effective tests and measurement instruments by using the latest educational technology both inside and outside the classroom. For we must produce graduates who have the requisite skills to perform at a high level of competency in business, industry and government service. In other words, our challenge today is to prepare our young men and women to embrace change as they confront the complex social and economic challenges of the new century.

This new educational paradigm will also oblige instructors to function as mentors instead of inert dispensers of knowledge and information. They will be expected to use the tools of information technology to help students access, analyse and share information. In this way, students will become more proactive in acquiring knowledge and less docile in their relationships with instructors. They will also need to become more willing to work in teams and more comfortable with using electronic technology to share information and ideas. This will be a different role for many, one that will take them some time to accept and absorb. But it is imperative that we commit ourselves to this new teacher-learner paradigm and exercise patience in helping students use educational technology in more efficient and creative ways.

**Ladies and gentlemen:**

Technological education today is at an important crossroad. We can either benefit from the forces of technological change or be overwhelmed by them. The challenges are out there and we dare not be timid in accepting them. We must become more innovative and flexible in meeting the learning needs of our students and more willing to reach out to our communities for support and validation. We must focus on new learning initiatives and new strategic alliances that will help us shape a truly future-oriented system of education---a system that builds efficiency through community partnerships and ensures effectiveness through continuous evaluation. In sum, we must develop an educational system that relies on the same technology which drives social and economic change throughout our global community.

I am confident that conferences such as this one can help us stimulate dialogue, develop insights and sharpen thinking about all of these issues. In doing so, we can help create a culture of change that will enlarge our perspective on how to develop the most effective technological education for the new century.

Once again, I extend a warm welcome to all of the participants and I wish you a very productive conference and an enjoyable stay in our beautiful city of Abu Dhabi.

Thank You.

# KEYNOTE LECTURE TEND 2000 - ABU DHABI

## The Virtual University : A Strategy for Education and Technology towards Development.

by

**Dr Geraldine Kenney-Wallace**
**Managing Director and Vice-Chancellor**
**BAE SYSTEMS Virtual University**
E-mail : geraldine.kenny-wallace@bae.co.uk

Education and Technology are undoubtedly the twin roots of competitiveness for the 21st Century and thus of economic, social and national development. But have they not always been the drivers of social and economic evolution and revolution, over several millennia? It is an honour for me to address you today on this very timely and topical subject, and to share the journey of the Virtual University.

It has always been what we know, what knowledge we communicate and share, and what knowledge we apply for the public good or private benefit that has characterised our societies, East and West, North and South. Over the centuries of internal and international trade and commerce and evolving cultures and the arts, science, medicine and technology have flourished and influenced all our lives, contextualised and embedded with the values, ethics and religious beliefs of the societies and the communities in which we live. The explosion of multimedia technologies in general, and the Internet in particular, means that we can live virtually in each others communities, experiencing to some degree the life of a truly global village in its emergent stage.

Why is today different? Why are companies and countries seeking novel strategies to formalise life long learning? The answer is that technology, globalisation and culture have coalesced and have forced unprecedented and rapid change on the work place environment too - *Knowing what one does not know, is becoming as important as knowing what one does know.*

Yes today is different. We have a global tug of war for talent. And in response to that, in the Spring of 1997, the company formerly known as British Aerospace decided to create a corporate university, quickly branded 'The Virtual University', as a pioneering company response to building a new 21st Century knowledge capability within the company. By focusing on individual learning and company-wide learning through education, training, professional development, research and technology, the company signalled in this bold move that Learning and Research were at the core of the company's growth strategy for the future.

In response to volatile and changing markets, to ongoing global consolidation in the aerospace and defence sector, and to the imperatives of team work and sharing best practice to deliver cost-effective results and products to customers on budget, on target and on time, a new coherent and cohesive company-wide strategy was necessary. We sought to integrate and add visible value to the long standing but independent training traditions of the many autonomous business units across the company that comprised British Aerospace plc.

The history of British Aerospace and the Change Management programme set into place beginning in 1995 by Sir Richard Evans, the then Chief Executive, have been written up (Evans and Price, 1998) in the context of the remarkable and turbulent history of the company and its turn-around performance during the 1990 s.

Emerging from this era, the Board of Directors in March, 1997, approved the corporate University proposal and, in a climate of restructuring, mergers and acquisitions, across borders and across sectors, the Virtual University set out with a vision and strategy to motivate life long learning for all employees and to develop creative and critical thinkers and doers. We needed to foster individuals and teams whose minds knew no bounds but grew from practical experience and deep insight within the rigours and complexity of a Systems Technology Powerhouse - new BAE SYSTEMS - operating in a truly global market place.

Learning to learn and self-motivated to follow a learning career, employees would thrive within a newly repositioned learning organisation. These were our goals - a vision with a deadline in the year 2000, although evidence shows true cultural change takes at least a decade to occur. We would sow the seeds.

Recruitment and retention of employees is also encouraged by the opportunity for personal development. Progression through different positions should include changing directions of careers, with international assignments made easier by the availability of portable and internationally recognised professional development. These are today's discussions at the interview stage. The challenge for a 21st century company is to have created an innovative work place, where there is a natural and effective transfer of knowledge, ideas and know-how (from both the individual and from teams) in to the daily work environment leading to enhanced business benefit, and ultimately shareholder value.

Today BAE SYSTEMS has annual sales of over £12 billion, employs almost 100,000 people in nine home countries (115,000 when the joint ventures are included) namely UK, USA, Australia, Canada, France, Italy, Sweden, Germany and the Kingdom of Saudi Arabia. The company is ranked as the number one Aerospace and Defence Company in Europe exporting to over 70 customer counties, and number two Defence company globally. BAE SYSTEMS is now also the number three Aerospace Electronic company in the world, a signature of the changing nature of the company's business as it repositions into a Systems Technology Powerhouse with a very strong focus on leading edge technologies, life-cycle management of its products and services and on customer support and solutions.

The Virtual University (VU) has just completed its third year, from concept to operational reality in the former British Aerospace plc, with 47,000 employees. Undoubtedly the VU will evolve into a new phase of operations given these novel and exacting global challenges. However, the company-wide coherent strategy and flexible frameworks that the founding team of the VU have developed for education, training, research and development, namely for the integrated personal development of the people, for research and technology acquisition, for the benchmarking and sharing of best practice, and for communications and external involvement, will strongly guide the future VU direction. Indeed, the lessons learned from the VU journey are in many cases generic and could be applied to other large organisations, even countries, under a new dynamic phase of development in this knowledge driven global economy.

What is the Virtual University? It is a coherent strategy towards international competitiveness that twins academic and business excellence. This Learning and Research Strategy is open to all employees, not just the senior managerial or technological groups. Further more, in reaching out, the VU is increasingly offering its services to the vitally important supply chain, our company partners including Joint Ventures and our customers.

The strategic intent for the year 2000 is to deliver a portfolio of integrated and business-aligned world class Learning and R and D services from a global perspective, in support of BAE SYSTEMS aspirations.

The VU from the outset has evolved upon the principle of Partnerships in order to first define the articulated business needs for which education and/or research was the answer, and secondly to co-design and deliver with strategically selected academic partners the appropriate courses, programmes, Rand D projects or Best Practice benchmarking to meet those needs.

Of course, in a period of mergers and acquisitions, the business needs are constantly changing. The advert of e-business sweeping through business operations will be as least as radical and revolutionary as computer aided design and smart manufacturing has been to the aerospace production lines over the past decade or so.

During that decade, the total production time for a sophisticated plane decreased from 36 months to 18 months and is still getting faster as lean manufacturing concepts and innovative use of technologies become embedded in the work place. At the same time, the enhanced quality and reliability of the aeroplane is already projected to lead to 40 or 50 years inservice with refurbishment and technological upgrades taking place at given intervals. Aeroplanes of the future 'the superjumbo' are envisaged as flying hotels in terms of the services offered and freedom of passengers to be seated to dine or to walk around naturally between foyer-like spaces, all over 37,000 feet. The structure and dynamics of shorter production times and longer in-service times for civilian aircraft shift the customers interest to life-cycle management and full customer support through this period. The market has changed and in turn the capability of the company and skills of the employees must be responsive and ready to lead this change.

The VU's original mandate was envisaged in three areas to build this 21st century knowledge based capability.

1. To catalyse, capture, communicate and embed internal and external best practice towards enhancing business excellence, and to leverage knowledge management across boundaries. The VU created and launched the Benchmarking and Best Practice Centre in Spring, 1998, and it now regularly hosts Business Excellence Workshop Days across the company, maintains over 300 case studies of Best Practice available on the Web site for employees to share, links into selected UK and International Benchmarking foram, such as EFQM and the American Productivity and Quality Centre embracing the Fortune 500 companies.

2. To align, integrate and develop existing ad hoc training initiatives into company-wide programmes, and to design new programmes and partnerships in support of personal learning, new competencies and skills as articulated for present and future business needs. These courses would be co-designed with our selected academic partners, through whom we would also seek accreditation and ensure quality and standards were scrupulously met. Twinning business and academic excellence can be best accomplished by building on partnerships of respect and trust. Today, we have over 3,000 courses, from short courses on IT training to post-graduate Masters in Systems Engineering collected on the VU Website electronic prospectus, called the Learning and Development Guide, accessed via the Intranet from desk-top computers, home, or the over 45 Learning and Resource centres across the UK and in USA, France, Germany, Australia, Sweden and Saudi Arabia which offer access and personal support to the employees (see Figure 1). We will return to the design of these courses later, and the role of the L and D guide.

3. To research in order to provide knowledge and expertise to support technological, strategic development, from within or outside of BAE SYSTEMS. This research and development focus builds Strategic University Research Partnerships and pre-competitive research consortia, whose results, as appropriate, can also flow back into the education courses and provide real-world project challenges for work-based learning linked to business needs, as well as provide examples of best practice.

**Figure 1**

BAE SYSTEMS

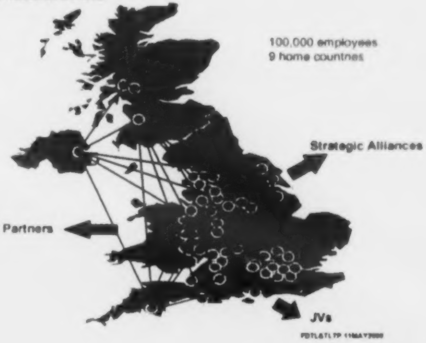
TOWARDS A COHERENT STRATEGY: ACCESS

1. Virtual University Network of Learning Resource Centres

   39 across UK sites;
   USA, France, Germany,
   Australia, Saudi Arabia, Sweden

2. Learning & Development Guide

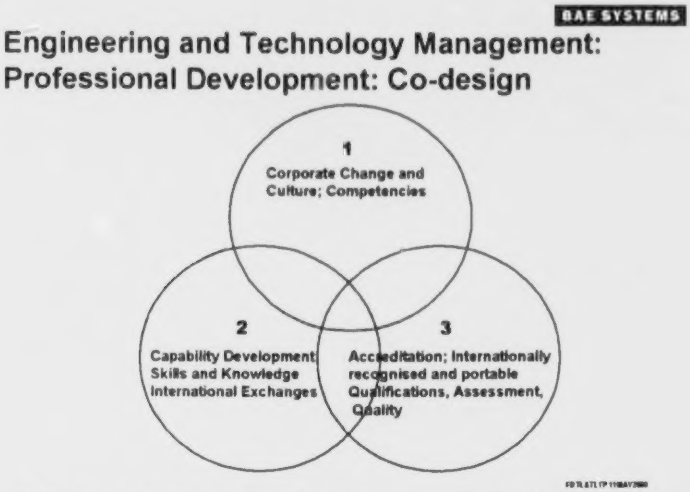
   Web Site prospectus
   Over 3000 courses
   Computer-based learning
   Job placement database
   Advice on careers
   PD Plans
   Learning Styles



Step towards a coherent strategy in the VU design began with the issue of Access for all employees, which the Network of Learning Resource Centres illustrated in Figure 1 addresses. From its embryonic stage of a few isolated centres in 1997 to a fully operational networked in 1999, with high band width capacity to now webcast in real-time important company learning or official events for wider audiences of employees, the Network is the backbone of the Access and Shared Learning Strategy, and will be expanded globally in 2000.

Figure 2 exemplifies the approach to design by the VU and its internal business and external academic partners.

**Figure 2**


Engineering and Technology Management: Professional Development: Co-design

BAE SYSTEMS
1
Corporate Change and Culture; Competencies
2
Capability Development; Skills and Knowledge International Exchanges
3
Accreditation; Internationally recognised and portable Qualifications, Assessment, Quality

At the centre of the three circles is the VU logo, because that is the goal for each programme, a carefully crafted balance of (1) Culture and Competencies, (2) Skills and Knowledge and (3) Quality and Accreditation. For example, in professional development for modern manufacturing and engineers, the strongest overlap is between (2) and (3) but the need for significant contributions form (1) has to be addressed. For human resource professionals, the needs were seen in (3) to ensure the highest standards of recognition, while international sales and marketing and procurement professionals were heavily focused in (1), for the need to change culture and competencies but were eager to build up in (2) and (3). The aim is to find the right balance as one addresses the contemporary business needs from project management on a global basis all the way to legal and WTO regulatory systems and to e-business which such as B2B for which BAE SYSTEMS recently announced a global partnership with Boeing, Raytheon and Lockheed Martin.

The Learning and Development Guide also contains important job placement opportunities around the company, a serious but light touch analysis of individuals' learning styles to take the fear out of learning, profiles of different careers, personal development plans and advice on how to take the first steps in one's learning career, from apprentice to post graduate levels.

In summary, the journey of the VU todate with its small founding team of 20 and its far larger group of virtual teams across the company and academe, has taken us to the point where over 3,500 people participated in 1999 in learning events, on-line training, professional development courses, management certificates, degree and post graduate programmes that did not exist in 1997. Full details are available at the BAE SYSTEMS VU Website.

But this is only the beginning for BAE SYSTEMS. As the VU added and developed the intelligent concept search engine Autonomy with the Cambridge company of the same name over the past 18 months, so the answer to the question 'Do you know what you don't know?' becomes clearer and the power of the individual to cut through the data deluge and focus on the knowledge for business benefit shines through. Education and Technology are invaluable partners for development in the 21 century, East West, North, South in our global village.

TEND 2000

Crossroads of the New Millennium

# Rival Views Of Technology: Leadership Lessons For An Uncertain Future

Prepared and Presented

By

**Dr. Paul A. Elsner**

Chancellor Emeritus

Maricopa Community Colleges

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Saturday 8 April, 2000

Theme Speaker

# Abstract

In the latter part of the 20th century, technology has been an extraordinary metaphor for, if nothing else, the advocating of change. The assumption has been that a large investment in technology, and a lot of technology to show for that investment, indicates that the investor is on the edge of change. However, technological innovations have not wholly assisted leadership in forming a clear view of the future or of the changes necessary to get there. Technology has suggested future positioning, but it has not, for unexplainable reasons, allowed us to generate a coherent future for higher education. Technology has impressed us with its dazzling momentum and its tumultuous nature, but it has hardly given us enough time to envision all of its implications.

At the front edge of a new century, higher education faces tremendous challenges in keeping pace with the progress of technology. Technology is one of the great drivers of the free market and of the learning revolution that is sweeping higher education. As traditional revenue sources shrink and competitive learning options increase, higher education is being shaken out of its traditional roles, modes of delivery, and patterns of organisation.

College leaders striving to maintain a technology edge must sort through rival views of the future to remain viable in the rapidly evolving education marketplace. Many of us who have been riding the waves of technology for a while are beginning to realize how precarious the surf can be. We are only beginning to learn our lessons from these experiences, and prominent among them is the importance of looking beyond artifact and glamour to the broader assumptions and implications connected to our use of technology.

## MARICOPA AS BOTH TECHNOLOGY PIONEER AND SCEPTIC

The Maricopa Community College District has enjoyed a premier reputation in technology accomplishments. For more than 20 years, we have aggressively invested in and experimented with technology to improve teaching, learning and the management of college and district services, and we have achieved a degree of success and acclaim. As we survey these achievements, we recognise their ephemeral nature and acknowledge that we must constantly assess and renew our relationships with technology in the expanding entrepreneurial educational marketplace.

Maricopa's technology achievements include several precedents. Maricopa was the first community college district to integrate voice, video, and data in a wide-area network covering all ten of its campuses. Maricopa developed the architecture of a distributive system when most other large community college districts depended on central processing units. Maricopa boldly built high tech centres the size of football fields, allowing all disciplines in a college to use one central facility for teaching and learning. Maricopa perfected open-entry/open-exit instruction with the use of pervasive technology support. Maricopa passed two significant bonds -- one in 1984 for $75 million and another in 1994 for $385 million. The latter was the largest bond passage in the history of community colleges, and $130 million of it was dedicated to technology purchases and acquisition. Maricopa leads the nation, perhaps the world, in offering the largest alternative delivery enrollment through Rio Salado College, one of the original "colleges without walls." Currently, over 400 sections are offered on the Internet, which, when combined with all other distance learning formats, contribute to enrollments of over 12,000 students in various alternative delivery courses, including telecourses, teleconferencing, and World Wide Web delivery.

Maricopa continues to invest in huge and bold application software experiments like our Learner-Centered Systems Project, which will place more power in the hands of students. In the future, students entering Maricopa's modules or courses will "own" their academic records. That is, students will have instant access to their academic and financial histories, and will be able to control their paths of probable career placement through greater information references and factual databases. In addition, Maricopa's concentration on network expansion and bandwidth capacity, as it builds one of the most sophisticated networks in higher education, holds great promise for bringing a world of discovery and learning to students' fingertips.

With this great promise come several assumptions about the changing nature of learning and the higher education market; these assumptions shape Maricopa's technology agenda:

1. In higher education, marketing will shift from production-driven processes to customer-controlled strategies. By this we mean that free markets will shift power to the students. Students will have spending power. Groups of students will eventually create alliances and purchasing cartels to offer their enrollments to the lowest bidders.
2. Because the learner is the centre of everything, the Maricopa Community Colleges are concentrating on designing distributed learning technologies.
3. Maricopa's arsenal of learning support features the integration of the Web, e-mail, video conferencing, groupware, simulations, news groups, distribution lists, chat rooms, instructional software, highly productive authoring labs, and multi-media production support. These technology applications become solutions to time, distance, and style barriers faced by the adult learner.
4. Places like the Maricopa Community Colleges are disadvantaged in the new marketplace in that they do not hold a monopoly on convenience. Colleges that enjoy what is called medallion status -- brand names like Harvard and MIT -- can now initiate Web courses or multimedia courses and invade the convenience market. Although access to public funds gives community colleges a fleeting monopoly as low-cost providers, the free market will probably cause the dissolution of that advantage as well. Thus, community colleges must offset the established cachet of premier institutions with learner services and easy access, asserting the commitment to place the learner first.

It seems no small irony that, as leading investors in technology, we find ourselves one of the more sceptical and tentative proponents of technology. At a recent conference of the American Association for Higher Education, I gave an address entitled, "Nervous on the Edge of Technology." My message was that although higher education leaders find themselves in a sea of enthusiasm for technology, much of that enthusiasm is unexamined. For example, attendance of 4,000 at a League for Innovation technology conference is not unusual, and great energy is generated in meeting rooms as hundreds of panelists and speakers demonstrate their wares and show their most recent triumphs. However, behind all this enthusiasm and the general euphoria for technology, which is fueled by the vendors and marketers of that technology, is an eerie absence of a reason for buying the latest product applications.

The case could be easily made that most community colleges, as buyers of technology, have been "had" by the vendors. Consider these propositions in support of this allegation:

1. Vendors, both large and small, have had the corporate monopoly on Releasing product development in a way that keeps the consumers Constantly in the reactive mode, even though colleges spend millions of dollars for hardware acquisition and on applications software.
2. One of the industry's greatest hoaxes has been its "pushing out" of application software. Most community colleges will attest to having spent agonizing months, even years trying to correct and adapt bad product design to real-time applications in their colleges. In some cases, these applications serve such simple functions as admissions, records and the support of learning systems.
3. The computer industry is an industry that brags about its product efficiency, but it has no fundamental efficiency in the marketplace of users.
4. Often computer industries will create elaborate user groups on the Assumptions that the users have some sense of ownership of product development. However, many commercial vendors do not have a clue what users need or want.

Still, the challenges facing Maricopa and similar institutions worldwide continue to force higher education leaders to turn to industry and its vendors for guidance. The tremendous changes occurring in society, so intricately interlaced with technological advancements, have left leaders in the educational world unsure of the technological future.

## MANY WAYS OF FORESEEING

What are some of the competing views of the future? I have argued that higher education does not have a coherent view of the future of technology; however, some views are emerging without higher education's help or involvement. Each view has implications for the role of technology, and each represents a different force that will undoubtedly be woven into the social fabric of the new millennium.

## FUTURE AS CYBER-FREEDOMS

One emerging conceptual image of the future is that of cyber-freedoms, a model derived from the Internet. The coda for this model is that I can communicate on my own time, under my own conditions, and with everyone, everywhere. The editors of such publications as Wired magazine best espouse this emerging social view, with its images of the future that have a revolutionary tone and oppose large organisations like television networks, corporations, universities, government, and, particularly the United States Federal Communications Commission. The cyber-freedom model holds the following implications for individuals and nations:

1 Borders are redefined.
2. Nation states are less important than they have been.
3. Individuals feel more empowered that they have in the past.
4. States cannot be seen as responsible for as much as they once were.

In general, authority is being redefined in this view of societal progression. The state and the nation play lesser roles in our lives, and most autonomous, decentralised commerce is seen as a self-organisation, self-correcting improvement in economic practice. The metaphor of the Internet characterizes this new society: highly intuitive, highly self-organising, and highly empowered.

Evidence of cyber-freedoms as an emerging model that has the potential to impact higher education can be found not only among student populations, but also in the faculty ranks. In January, 1994, Bill Strauss, co-author of the 13th Gen, addressed our faculty at the annual All Faculty Convocation. Following Strauss' presentation, Vernon Smith, a 13th Generation faculty member at Rio Salado College, stood up in front of hundreds of faculty and strongly defended his generation. Using the following manifesto, Vernon spoke of how the 13th Generation, or Generation X, whose members are sometimes referred to as slackers, might view higher education:

- Truth is much more subjective than one might think. People, governments and professors have their own "spin" on truth.
- Information is not found in any single source or form.
- For the future, control and access to information is power.
- Show me how to get and use that access.
- Help me learn how to learn. Some instructors are no longer the source of information, of truth, they can take a more useful role as facilitators of learning, not the source.

- Don't bore me. If you are going to stand up and lecture me from your yellowing notes, put it on a disk , and I will take it home and read it on my time. Use an electronic forum or presentation -- music, video, computer-based tutorials, visual peripherals -- not just lecture.
- No ideas are new or unique -- there is nothing new under the sun.
- Pooled knowledge and appropriation are not plagiarism.
- Be explicit with your expectations in the classroom. I want to know all of the hoops you want me to jump through from the start.
- Teach me process, not content. Don't mark down my grade on a paper for a misspelled word (a content issue). Mark down my grade for forgetting to click on the spellcheck button (a process issue).
- Remember that I am strapped for time and out of money. Between the Mcjobs, school and play, I know where the payoff will be.

The ideas in the Generation 13 manifesto are being noticed. Perhaps Tony Carnavale (1999), Public Policy and Leadership Executive for the Educational Testing Service, describes the cyber-freedoms model most succinctly: "The new activists, who are often business people, have an almost pure interest in reforming education -- they have no concern about the politics of it or the cultural issues associated with modernisation" (1999).

Reform in cyber-freedoms fashion takes shape through connectivity, rapid evolution, and self-orgainsation. In a Wired magazine article entitled "New Rules for the New Economy," Kevin Kelly (1997) describes how connectivity is the essential currency of the cyber-future:

"Everything becomes connected -- billions and billions and billions of connections so the network redefines the economic premises of our lives. It drives all the new commerce, which is shorthand for connections….."

As we implant a billion specks of our thought into everything we make, we are also connecting them up. Stationary objects are wired together. The non-stationary rest -- that is, most manufactured objects -- will be linked by infrared and radio, creating a wireless Web vastly larger than the wired Web. It is not necessary that each connected object transmit much data. A tiny chip plastered inside a water tank on an Australian ranch transmits only the telegraphic message of whether it is full or not. A chip on the horn of each steer beams out his pure location, nothing more "I'm here, I'm here." The chip in the gate at the end of the road communicates only when it was last opened: "Tuesday". (pp. 141-142) Kelly goes on to explain that this is a process of rapid evolution, and not all of this connection is going to occur overnight.

The whole shebang won't happen tomorrow, but trajectory is clear. We are connecting all to all. Every step taken that banks on cheap, rampant, and universal connection is a step in the right direction. Furthermore, the surest way to advance massive connectionism is to exploit decentralised forces -- to link the distributed bottom. How do you make a better bridge? Let the parts talk to each other. How do you improve lettuce farming? Let the soil speak to the farmer's tractors. How do you make an aircraft safe? Let the airplanes communicate among themselves and pick their own flight paths. In the Network Economy, embrace dumb power (p. 142). In the cyber-freedoms future derived from the Web, traditional boundaries become redefined as connectivity blurs the lines. Orgainsations, including nations, states, and governments become less important than individuals, and as power moves to the level of the individual, the processes by which we solve our problems become self-organising, self-empowered, self-connected.

## FUTURE AS COLLECTIVES

A second emerging future is defined by the special interests that drive policy direction and become more important than schools, governments, or universities. The burgeoning power of such special interest collaboration is evidenced in the Beijing Women's Conference, the Rio Summit on the Environment, the Cairo Population Conference, and the Singapore Conference on Thinking. A future defined by the hegemony of such collectives implies that our connections and our collaborations drive more significant events in our lives than do the authorities to which we are normally responsible. No head of government could forge as expansive a women's agenda as the Beijing Conference, nor could the politics be as local as actual issues women face in their families, their villages, their communities, their religious environments, and their countries. Reflecting the pervasive power of some religious collectives, the Cairo Population Conference broke down when population control became the central agenda issue.

More, the future as defined by special interest collectives will find the coalescing of groups along lines that ignore conventional boundaries. As we become more globally interdependent, individuals will move about the world, fashioning business and personal bonds within the new international community. The growing world-wide eco-consciousness, which is stimulating international responses to traditionally national decisions about levels of pollutants and consumption of natural resources, hints at the power potential in the new collectives.

## FUTURE AS MEDIA

Still another prospective can be envisioned as a media-defined future. This future presupposes that media shapes global attitudes because of similarities and tastes in music, film, art, food, clothing and lifestyles translated through shared media-based experiences. Today, approximately 800 million teenagers around the globe listen to the same sitar, rock n' roll, steel band, Reggae music, and video productions. Madonna, R.E.M., and other international entertainers set cultural standards around the world. In many ways, our multicultural world is becoming increasingly monocultural through the effects of mass media. The media-based collective model of the future is more youth-centred, and its tastes, desires, interests, and perceptions are created by and reflected in television, film, video, music and other ubiquitous media. Standards of sound and visual quality are extremely advanced. Young people demand a high fidelity, high resonance, and quality standard that determines the basis on which they will receive information. They have lived with the highest video standard we have ever known.

Global acculturation to media is staggering. Increasingly, the media define our accepted limits of violence, drama, romance, heroism, and even love, yet few technology planners take into account the homogenising effects of global media. No doubt, positive futures could be projected as well as the negative ones that are predicted. Again, here rests the potential for building an even more coherent future for technology. If teenagers are listening to the same sitar, alternative, hip hop, steel band and rock n' roll music, then they are at the same time seeing the same signature clothing ads and resonating to the same general values of love, romance, heroism and increasing violence. Just as Reggae and rock have fused, so have the youth cultures. This youth phenomena may have more implications than any other alternate future. It has shaped and will continue to shape massive global, commercial, economic, and market policy. For a country like the People's Republic of China, which exports 80 per cent of the global clothing market, the implications are staggering.

Finally, in considering how a collective mental view of a future can shape destiny, I turn to the example of the 1939 New York World's Fair. The 1939 World's Fair is an excellent example of how a single event helped shape an entire era, in this case perhaps five to six decades of a country's values and culture. The vision proposed at the 1939 World's Fair, during a troubled and shaky time in US history was of a better standard of living, beneficial modernism, suburban optimism, unlimited consumption, and the massive modification of American products. The promise of technology for a good life -- first the automatic washing machine and dishwasher, then the microwave -- changed America in profound ways that, perhaps, were not foreseen. Americans drew a new national identity from the fair's utopian visions and promise of prosperity for the common man. From this new ideology, the US colonised the future with a standard of technology and consumerism that has lasted 60 years.

## SIFTING THROUGH THE FUTURES

As new waves of technological change and competing views of the future approach, I ask only that we examine our technology revolution in more thorough ways. The 1939 World's Fair is illustrative of an extravaganza building upon a hopeful vision. It drove future decades of consumption and unprecedented material pleasure. At the World's Fair, people visited massive pavilions illustrating a happy, hopeful future of freeways, automated machinery and conveniences in the home that would allow new leisure and a more pleasurable existence. At the time, Europe had entered World War II and America clung to a hope of peace; two years after the Fair, that hope was completely shattered. After the war, the American people renewed their commitment to the images of peace and prosperity they saw at the 1939 World's Fair. In a sense, these images colonised the future. America's imperial destiny, as played out in the moon landing and the NASA space shuttles, was marked with the long-term effects and the unpredicted fall-out of technological imperialism.

One cannot blame all of our social ills on a blind commitment to technological development, but that development has contributed to our current struggle with the complexities of poor air and water quality, overcrowded cities and unsafe neighbourhoods. We have saddled ourselves with social problems that possibly could have been avoided by envisioning a different future. Too often, the influential and powerful do not see much beyond technology's euphoria and dazzling momentum, which they mistakenly identify as progress.

At a League for Innovation Conference on Information Technology in November, 1996, which attracted 3,600 participants, I presented a video-assisted speech that outlined the consequences of five decades of unprecedented expansion, development, and consumerism -- all riding the crest and glories of technology. This video's closing metaphor is the depiction of the seemingly bottomless swamp of the Fresh Kills Landfill in New York, which by height and depth exceeds the elevation of Denver. Fresh Kills is the highest point of elevation among the New England seaboard's land masses and by 2010 will reach more than six miles in height and width. This manmade mountain is testimony to the unforeseen effects of our rampant consumerism and technological progress. The social critic and artist-in-residence for the New York City Sanitation Department, Marian Laderman Ukeles, is using Fresh Kills in creative ways to communicate the effects of our technology decisions. At the Marine Transfer Station in Lower Manhatten, Ukeles presents "Flow City," a multimedia collage of technological accomplishment and waste, not unlike a Jackson Pollack painting. A block-long tunnel made of recycled materials presents cross-cuts of the waste of two or three generations, from our infatuation with the acrylic world -- hula hoops, old toothpaste containers, broken bottles, and bean cans -- to the more recent throw-away society of old Apple II computers, broken television tubes, and Radio Shack modems. At the Glass Bridge, visitors can see and hear the dumping of new waste as it arrives. As the compression chambers crush the technology we threw out last year, a wonderful cacophony echoes the theme repeated in the symphony of technology progress during the last several years. A Media Flow Wall with 24 television monitors shows us videos and live camera shots from Fresh Kills.

Ukeles' artistic treatment of our technological byproducts is meant to be instructive for touring children. As they visit the Manhattan Transfer Station, they can see that our habits of consumption are not someone else's, but are the result of our own decisions about what we value, what we purchase, and what we throw away. Through an artist's view, school children can see the past and its influence on the future.

## TECHNOLOGY FUTURE AT MARICOPA

The technology beat goes on at Maricopa. We continue marching. While we have been described as visionary, we have also heard more sobering arguments that call for our perspective of a more coherent future. We are only beginning to learn our lessons from these experiences, and high among them is the importance of looking beyond artifact and glamour to the broader assumptions and implications connected to our use of technology. Based on the overarching assumptions described previously, Maricopa is orienting its technology future in two strategic directions:

1. Internet-based software architecture, and
2. Distributed learning systems.

Implementation activities are underway in both areas.

## INTERNET-BASED SOFTWARE ARCHITECTURE

Ron Bleed (1997), Maricopa's distinguished Vice Chancellor for Information Technology, outlines the rationale for adopting a browser-supported platform in his comprehensive report, "Innovation Advantages for New Realities." Among the advantages Bleed outlines are ease of adaptation, flexibility, multi-media integration, Internet protocol, and, most critical, the shift to more learner-centred control of information:

The new software architecture is rules-based and built with objects. Ease of changes, purchasing new features through the objects, and integration to other software provides the needed ability to keep the software changing with changing needs in Maricopa. In the atmosphere of ten autonomous colleges, Maricopa will be well served by this flexibility. In the future era of rapid change and integration with other orgainsations, Maricopa will need software with those same attributes. The Internet architecture is another cornerstone for new systems.

The Internet has merged video and audio with the computer media. Browser-oriented software language is the great integrator of multi-media which makes it the vehicle for the new learningware developments. Browser-oriented computing involves a decision shift from a desktop centric model to a network centric one. Internet-based software has the potential to fundamentally change the way information systems are constructed, managed and used. As everyone connects to the Internet, whether they are faculty or students, and begins to exchange information, we will need software that puts education on-line. At the present timeline, Maricopa will be among the first colleges to have an internet-based, programmed student information system. The reengineered design specifications for creating a learner-centred system are a perfect fit for Maricopa's strategy (p. 9).

## DISTRIBUTED LEARNING SYSTEMS

The second innovation advantage that Maricopa currently holds is its commitment to distributed learning systems. A Centre for Distributed Learning, is planned for more than one of our colleges, with Mesa Community College as the first. The online description of the Centre for Distributed Learning offers this definition:

"(Distributed learning uses) a wide range of information technology to provide learning opportunities beyond the bounds of the traditional classroom. Some examples of distributed learning technologies include the World Wide Web, e-mail, video-conferencing, groupware, simulations, news groups, distribution lists, chat rooms, MOOs, and instructional software. A distributed learning environment facilitates a learner-centred educational paradigm and promotes active learning. "

As Maricopa evolves into an elaborate system of help desks, call centres, and course facilitation, three to four thousand courses could end up on the Internet within the next two years. We are currently doubling Internet courses every semester. As Linda Thor, President of Rio Salado Community College, frames it, "Maricopa does not have courses up on the Internet; it has, in Rio's case, the whole college." This new education delivery system, however, does not preclude the omnipresent need for support of student learning. Studies of online learning at Maricopa reveal that the best predictors of student success in Internet-based courses is a faculty phone call to the student during the first week of classes. Our experiences validate what we have always suspected: technology very seldom stands alone. Elaborate support systems are needed to brace technology and are analogous to an iceberg in that technology is only the tip; underneath good technology are massive student support and increasingly intricate, self-organising networks of learning communities.

## EPILOGUE AND GENESIS

This paper does not offer many solutions. Instead, it begs higher education to develop a more coherent vision of technology and asks that we not simply ride out its crests, waves, rivulets, and surges of progress. It calls not only for being impressed with technology's dazzling momentum, and its tumultuous nature, but also for positioning and, at times, offering counterpoint to the technology solutions with which we seem so enamored. I like Kevin Kelly's (1997) call for the "devolution" as well as the "evolution" of our orgainsations:

You've got to clear out the top of your orgainsations and you have to be ready to push back down into the valleys when you have reached the top of your peak. We have not learned to devolve our orgainsations very well and most orgainsations only have a short life at their highest point. They have to learn to devolve to the lower valleys and build the uphill path to even greater and different achievements (p. 192). Ever so slowly, we are learning to undo and recreate ourselves at Maricopa. To be great at technology, we must also be critics of technology. We must look beyond the artifact stage of technology. Computers, in a sense, are passé. The massive amount of commerce generated by the Internet is making technology ever more pervasive, ever more self-organising, and ever more creative. We hope that Maricopa is rejecting the mode of simply buying technology and adopting the mode of critiquing, envisioning, and creating it. We also hope that major users of technology, like the community colleges, will band together to create purchasing cartels that will help stop the blind commercial exploitation of users. Too often, community college users buy inferior products rather than find their own solutions and define their own destinies. Developing products that meet community college needs is almost always better than purchasing "shrink-wrap" products that are offered commercially.

Ironically, we are passing through these millennial years at a time when today's mission-critical software is only newborn; at this writing, for example, Netscape is barely a few years old. We are in a position in the development of our civilization where we have discoveries that make the invention of the printing press seem small. We know what the printing press did to change the progress of civilization; is it not a wonder that we do not have an engaging view of the future for technology that really projects what its true and hopeful potential can be? We need that vision and we need that coherent view. Colleges riding the tsunami of technological change must recognise the absurdities of our old Cartesian views of the universe, look for larger patterns, and lift our technology agendas to fulfill the egalitarian mission we symbolise. Our new utopian future for technology applications rest in a learning-centred ideal. The agendas prescribed by all the alternate futures call for technology that allows the learner to rule. Whether responding to a future defined by cyber-freedoms, special interest collectives, or a media-defined youth culture, we must use educational technology to liberate the learner or we will find ourselves prisoners of the past. At the same time, we must engage the human and organisational possibilities of technology to uphold our values of community and social responsibility. Let us hope that the vision for such a future is clear to our leaders.

## REFERENCES

- Bleed, Ron., (1997). *Innovation advantages for new realities* (Report). Tempe, AZ: Maricopa County Community College District.
- Carnavale, T. *Address to the Scottsdale Community College Leadership Breakfast.* Centre for Distributed Learning.
- Howe, N., Strauss, B., and Williams, I., (1993). *13th gen: Abort, retry, ignore, fail?* Vintage Books.
- Kelly, Kevin., (1997). "The new rules of the new economy". *Wired*, 140-197.

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## Crossroads of the New Millennium

# Meeting Older Adults Learning Needs When Using Information Technologies

Prepared and Presented

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# Abstract

Globalisation of education made possible through developments of information technologies can have a significant effect by providing learning opportunities for individuals throughout their life span. The increasing need to make career changes during our working life demands appropriate and timely training and education. Simultaneously, there is awareness in many societies that the current trend of workers taking early retirement is a luxury, which cannot be sustained. Not only are skilled and experienced people lost to the labour force prematurely, but society in many instances has to support this large population into their old age. Although older adults generally have more time to devote to utilising this technology, they are the last to adopt its usage. This paper explores the problems which older adults experience with information technologies and suggests strategies which can be employed to address these issues. It reflects on the author's experience as both a designer of learning scenarios and as a researcher investigating learners' needs when using information technologies. Results of the author's current and past research will be illustrated as examples during the presentation.

# Meeting Older Adults Learning Needs When Using Information Technologies

## INTRODUCTION

Not so long ago, futurists were warning us that we could expect to change careers around three times during our working lives. This figure underestimated the frequency of job training/retraining. Directly related to this changing need, are the rapid advances being made in information technologies and their influence on work. Traditional jobs, such as those in production industries and in particular those involving manual labour, are rapidly disappearing and new positions are being created in services and information technology industries.

Concurrent with this major work revolution, is the development in many countries of a growing older population. Last year globally, there were 578 million people over 60 years of age. The phenomena of an ageing population coupled with changing patterns of work is viewed by some with dismay. The view is frequently expressed that older workers are less adaptable to change, particularly where information technologies are involved in the workplace. However, little research has been done exploring this relationship between these two events and investigating the opportunities which this situation may create. As educationalists, we have a responsibility to prepare individuals within society to minimise potential disadvantages that this trend may create and, at the same time, we should also seek to maximise potential opportunities for individuals and society as a whole.

Young people entering the workforce for the first time today can generally be considered to be more aware, confident, and competent in handling changes (such as those brought about by information technologies) than older, established workers. It would appear obvious that there is a need to build on our knowledge of how older workers can be assisted to cope with societal changes, including those impacting on the workplace. Armed with this knowledge, we can plan and develop learning materials for appropriate delivery to maximise older adults' capabilities in coping with information technology related and other changes.

## AGEING POPULATION

Patterns of population groupings vary from country to country, but there is a general trend in developing countries of the numbers of older citizens increasing at a faster rate than those of younger age groups. In this paper, the author has used mainly Australian figures to demonstrate population patterns, but similar trends are widely reported internationally. In Australia in 1976, 1.3 million people were over 65 years of age which represented nine per cent of the population whereas last year there were 2.3 million people over 65 years of age or 12% of the population (Bishop, 1999). Estimates for Australia predict, that by the year 2016; there will be 3.6 million or 16% of the population and by the year 2041, there will be 5.7 million. This latter figure represents one quarter of the estimated Australian population.

## IMPLICATIONS OF AGEING POPULATION

Factors which have led to this increasing weighting towards an older population can be largely identified with improved health-care processes and facilities. Individuals are becoming more aware of healthy lifestyle practices, such as in personal hygiene and diet. In the future we can expect individuals to take more responsibility for their personal and family members health and well being. This can be assisted by training older people how to learn using information technology resources, such as the Internet, to access information on health issues. This situation will be largely driven by the expected changes to traditional health-care systems which will be less likely to give individuals the current degree of medical practitioner care as the cost of this service escalates and new applications of information technologies become available. Personal monitoring of health condition through sensors located in the home and 'wearable computers' will increasingly empower patients to take care of their own health. Education and training on managing personal health-care will require new approaches by educationalists and health professionals to prepare individuals for this role.

In the past, statutory retirement ages have been legislated for in many societies. In Australia until recently, male workers were compelled to retire from full-time employment on reaching 65 years of age and female workers were compelled to retire at 60 years of age. This is no longer the case and individuals can continue to work indefinitely into their old age. Implications of this, one would think, would be that traditional barriers to older workers gaining and keeping jobs will be breaking down. However, this does not appear to be the case, at least in Australia.

Societies do not appear to be maximising on this labour pool of older workers who wish to continue or return to the labour force. Men between 55 and 59 years of age in particular are rapidly disappearing from the Australian workforce (Bishop, 1999). If you consider that many people are now entering the full-time workforce up to 10 years later than previously as they continue with full-time study, then the pool of potential employees is diminishing. This may be acceptable in times of low labour demand, but with many societies showing reduced unemployment trends then problems can arise in filling evolving employment opportunities.

The older population of unemployed, either through retrenchment or retirement, is a logical pool where employers can draw on workers. This is currently happening in the United States where programmes have been set-up to attract, train, and maintain older employees in evolving industries (Microsoft, 1998). Society cannot afford to waste the wealth of knowledge and expertise in our older workers who may be driven, or opt, for early retirement. Increasingly this will include workers with information technology skills in high demand. Peter Drucker, the management guru, predicted that organisations which succeed in attracting and holding knowledge workers past retirement age, and make them fully productive, will have a competitive advantage (Drucker, 1999).

Implications of this swing towards older populations are many and obviously include the need for appropriate and adequate health and welfare provisions. Technology-led change also demands that our education system identifies and addresses the changes required to meet the needs of an older population. This requires that we become more aware of older peoples' potential to learn and to choose appropriate methodologies to maximise learning.

## HOW OLDER PEOPLE LEARN

As detailed in the discussion below, learning is a lifelong experience. Although physical and mental capabilities diminish with age, involvement in stimulating mental (and physical) activities can maintain learning capabilities into 'ripe' old age with no age limitation. Hearing and sight are two obvious areas where decline takes place throughout adult life and speed of performance may drop, but often these can be compensated for with technology (see *Information Technology* below). Performance in some specific tasks may decrease as people age due to changes in motivation, interest, values, goals and self-image. Societies behavioural norms for age-related behaviour have in the past dictated older workers' directions. For instance, the rules on compulsory retirement at a set age. Many organisations today perceive a problem with their image when employing older people and this impacts on the greater ratio of people unemployed among older age groups.

Several theorists have attempted to identify differences in learning characteristics related to age. Knowles (1984) drew up a list of assumptions which he believed differentiated between adult and childhood learning. These were:

- the learner feels a need to learn
- the learning environment is characterised by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression and acceptance of differences
- the learner perceives the goals of the learning experience to be their own goals
- the learner accepts a share of the responsibility for planning and operating a learning experience
- the learner participates actively in the learning process
- the learning process is related to, and makes use of, the experience of the learner
- the learners have a sense of progress towards their goals

Knowles believed that learning achievement of older people could be improved by employing student/instructor learning contract. Critics of Knowles have pointed out that what he claimed was a theory was really only a set of principles and that his 'unique' characteristics of adult learning could also be applied to children. Nevertheless, Knowles work can provide some interesting starting points of comparisons between older and younger learners.

Cognitive style is a dimension of human functioning where differences have been detected between age groups. One of the most widely used instruments measuring cognitive style is Witkins (1971) *Group Embedded Figure Test*. Employing this instrument, researchers and psychologists can detect differences in individuals' degree of field-dependency/field-independency. People who are influenced by the surrounding field in a learning scenario are called field-dependent and those who are uninfluenced are referred to as field-independent. Researchers have shown that field-dependancy is relatively stable during young adulthood, but as people age they become more field-dependent and therefore learning scenarios targeting older learners should allow for this. Field-dependent people react to situations as a whole without analysing it, responding on the basis of what it does rather than what they do with it. On the other hand, field-independent people keep the individual parts of a situation separate from one another, ignoring these parts which are irrelevant to the task (Coventry, 1989). In the case of older learners using information technology, then workstation designers should be aware of cognitive function age related differences.

Another dimension of individual cognition is learning style which can be referred to as a subset of cognitive style and is defined as the way people absorb and retain information. A measure of learning style is Honey and Mumford's (1992) *Learning Style Inventory*. By combining the characteristics of learning and problem-solving processes, Honey and Mumford suggest that individuals learn in four modes:

- active experimentation
- reflective observation
- adaptive observation
- pragmatic involvement.

The choice of learning mode is governed by each individual's goals and his or her specific objectives according to Honey and Mumford. As was indicated above, affective dimensions which relate to motivation, self-image, and goal setting tend to change with age for various reasons. Significant influence may be expected by individuals as they adopt what they consider society's norms for their age group.

## INFORMATION TECHNOLOGY

Occupations involving information technology skills are increasing at the same time as many traditional occupations are diminishing. Electronic delivery of learning materials by CD-ROM, Intranets and the Web can provide a means for workers to re-train to meet the labour needs of evolving industries. The value of this means of delivery has been well documented in recent years and includes open access and self-paced learning. However, accessing information technologies is foreign to many workers as are the skills required to work independently with self-paced learning materials. In general, these disadvantages increase with age and are reflected in recent figures released in United Kingdom, United States and Australia. In Australia, for instance, a recent study investigating use of the Internet and its relationship to age, just over 74% of 18-24 year olds accessed the Internet in the 12 months up to May, 1999. The corresponding percentage of older people who accessed the Internet over this period was 53% (25-39 year olds); 39% (40-54 year olds); and 10% (55 years and over) (Australian Bureau of Statistics, 1999). Of particular interest, however, is the rate of increased numbers from the 55 year and over who accessed the Internet from the previous year. The percentage of Internet users doubled, which was a significantly greater rate than for any other age group. Increasingly, studies are showing that more and more older people want to become familiar with this technology, but for a variety of reasons many do not achieve this.

## POTENTIAL BARRIERS TO USING IT

Numerous studies have explored why some people have had problems utilising information technology. Reasons have included differences in learning styles, cognitive style, motivation, and technophobia (Cameron and Treagust, 1997). Technophopia, which includes anxiety, negative thoughts, and attitudes towards technology can be particularly disadvantageous in the Information Age (Rosen and Weil, 1992). Younger people, who have grown up with this technology, are less likely to be technophobe than older people, and are more ready to adapt to rapid societal changes.

Classroom research has demonstrated that many (if not most) students are more confident using information technology and have a greater degree of computer literacy than their classroom teachers (Bias and Carey, 1996). Many studies have reported on the teacher learning information technology skills from their students. Older people may have less opportunity to have readily available helpers at times when they are using these technologies. Many younger adults are working and running homes and have little time to build their skills under the supervision of a mentor. Older adults may be homebound and have little opportunity of exposure to information technologies.

If we look again at the Internet access figures related to age groups we can identify associated conditions which are fairly typical for each group. Adolescents/young adults of 18-24 years of age have generally been exposed to this technology during their compulsory schooling. Many are continuing, both part-time or full-time, with education and training and can be expected to be keeping pace with many information technology developments, such as Internet access courseware and computer searching. More mature adults in the 25-39 year age group are quite likely to be setting up a home and starting a family. Similar to many school teachers, they may be learning this technology through their children's interest in playing and learning. When we reach the more middle-aged years (40-54 years of age) this latter influence often diminishes as children leave home. Children are increasingly being viewed as a source for assisting older users become information technology confidant and literate. Setting students the task, either individually or in groups, of assisting older people with information technologies can often be a rewarding experience for both parties.

## LIFELONG LEARNING

Traditional classroom teaching to relatively large groups has been the main platform for societies' education and training programmes for over 100 years. Society has dictated set curricula, teachers impart information to students who 'throw it back' at exam time. The introduction of information technologies is forcing a long overdue appraisal of teaching and learning methodologies. New learning environments are occurring where individuals (or groups) can learn relatively independently. The challenge to educators, many of whom are loathe to depart from traditional methods, is to prepare learning scenarios that encourage the development of independent learning skills in our students. The wheels are gradually starting to turn as more and more educators practice constructivist principles, where the focus is on the learning experience, students are actively involved in forming their own interpretation, and have the opportunity to practice the development of problem-solving skills (von Glaserfeld, 1991). Students utilising this new learning environment are developing lifelong learning skills which can be transferred from learning scenario to scenario. Older adults tend to have had little exposure to constructivist learning experiences, almost certainly not from their formal education years, yet independent learning skills offer the greatest hope to allow older adults to 'catch-up' in today's workplace through open-learning (Hannafin, 1996) or self-paced learning (Hammond and Collins, 1987).

An opportunity to address this at national level should be taken with the introduction of digital television into the home. Interactive learning programmes should be designed to help older adults to develop lifelong learning skills utilising open learning and self-directed learning strategies. By employing the customising potential of this technology, material can be presented in a meaningful and practical way for the individual. This policy direction would significantly benefit individual older adults to cope with change and manage their work, social, financial and health needs in the future. To achieve this end, it is imperative that research is conducted to understand the special learning needs of older adults. The remainder of this presentation will be devoted to the author's experiences of researching older adults needs with perception and use of technologies. This includes the design of an instrument to measure older peoples' resistance to the use of information technology, measuring awareness and degrees of technophobia in the community and using a simulator to measure driving skills level.

## REFERENCES

- Australian Bureau of Statistics, (1999). *Use of the Internet by Householders*, Australia. http://www.abs.gov.au
- Bias, G., & Carey, C., (1996). "Students Teach the Teachers: How We Created Teams of Students to Do Multimedia Training". *Electronic Learning* 15(4), 18.
- Bishop, B., (1999). "A National Strategy for an Ageing Australia". *Address to the National Press Club*, Canberra. http://www.health.gov.au/mediarel/yr1999/bb/bbsp990608.htm
- Cameron, D., & Treagust, D., (1997). "Navigation Performance with Interactive Media: Impact of Learning Characteristics". *Proceedings of the Australian Society for Computers in Tertiary Education*. (pp. 94-100). Perth, Western Australia: Curtin University of Technology.
- Drucker, P., (1999)., *Management Challenges for the 21st Century*. Oxford: Butterworth Heineman.
- Hammond, M., & Collins, R., (1987). "Self-Directed Learning to Educate Medical Educators". *Part 1: How Do We Use Self-Directed Learning?* Medical Teacher 9(3), 253-260.

- Hannafin, M. J. , (1996). "Technology and the Design of Open Learning Environments", *IT Forum paper #14*. (ITFORUM@UGA.CC.EDU).
- Honey, P. and A. Mumford (1992). *The Manual of Learning Styles.* Maidenhead, England, Peter Honey.
- Knowles, , M. S., (1984). *The Adult Learner: A Neglected Species* (3rd Ed.). Houston: Gulf Publishing.
- Microsoft, (1998). *Department of Labour Grants Additional $8000,000 to Help Seniors Fill IT Jobs.* http://www.microsoft.com/seniors/default.asp
- Rosen, L. D., & Weil, M. M. (1992). *Measuring Technophobia.* Carson, California, California State University.
- Witkin, H. A., Oltman, P. K., Raskin, E., & Karp, S .A., (1971). "A Manual For The Embedded Figures Test". Pal Alto, CA, *Consulting Psychologists Press.*

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# Crossroads of the New Millennium

# Higher Education: Looking Towards the 21st Century

Prepared and Presented

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# Abstract

Possible directions higher education (HE) may take in developing countries in the year 2000 and beyond are discussed. Aspects emphasised include the desired practical working knowledge of graduates and the flexible management of institutions. Responsibilities of states will be to establish collaborative programmes and links, considerable IT investment and diversity of research. In curriculum development a broad-based first degree is considered in which students would be taught communication skills, humanities and at least one language. Specialization would occur at postgraduate stage. Widening access to learning will be achieved through advanced technology. Institutions largely use this to supplement existing teaching. Plans for a new corporate university in Scotland are described. Virtual education is discussed and it is concluded that young students will benefit from personal contact with the lecturer and other students.

"There is nothing permanent except change" as stated by philosopher Heraclitus in 513BC. Change is natural, to be expected and is regarded as a continuous process. History books still promote the belief that technologies shape societies and civilistions. New technologies which come to dominate production and working patterns drive commercial success, and subsequently national economy and wealth. In 1761, Adam Smith, educated in Scotland at Glasgow University, wrote the first major book on economics, "The Wealth of Nations", and describes how economic growth determines the nation's success. Consequently it follows that shifts in commerce determine the best suited knowledge and skills required by the workforce-and the education of the future workforce must equip them with the ability to participate.

Before discussing possible implementations for the year 2000 and beyond it may be useful to review the changing nature of higher education in Scotland and the UK in general, which, during the nineties, underwent dramatic modification. To paint a fuller picture some reference should be made to the events which called for such changes and the scenario which developed as a result of them.

# Higher Education: Looking Towards the 21st Century

## HIGHER EDUCATION IN SCOTLAND AND THE UK DURING THE NINETIES

During the 1980s, the changing nature of industry and the workforce in the UK was apparent. A shift from the manufacturing to services industry occurred. At the same time, unemployment was high with figures for the EEC showing it going from 2.7% to 10.3% in the 12 years up to 1985-but economists failed to agree on its cause. Continuing success of the manufacturing and exporting enterprises of developing countries was often assumed to be the cause, together with advancing technologies, both having the obvious consequence of reducing labour costs. The electronics industry, with the advent of the microchip, and now computer and word processor, could not be solely responsible because it generated as many jobs as it destroyed. Whatever the cause, it was clear that people no longer had a job for life. They needed the ability to learn as job specifications changed, and as they changed jobs. They had to be adaptable to improve their opportunities and education needed to respond-the message from the UK Government in 1984 was that 'training must be fully work-oriented and lead to jobs' and at the end of the eighties-'that the workforce had to become more skillful'.

Reactions to the perceived lack of skillfulness of the workforce included a change in educational goal from one of 'education for life' to ' vocational training'-the emphasis being on continuous education. The commitment to increased access to higher education meant a greater proportion of the population could participate. The older fashioned polytechnics became 'new' universities and could award their own degrees, and a new council and committee were introduced to deal specifically with higher education in Scotland. The 'new' universities of the nineties had been long established degree and postgraduate institutions and contributed significantly to HE expansion-they made up the public sector of higher education as opposed to the university sector-and were subject to political and academic accountability through their local Authority and validation by their own council CNAA, Council for National Academic Awards. They were responsive to the needs of the local and regional communities and were committed to vocationally oriented programmes, drawing widely from their surrounding localities and encouraged links between communities and business. Additionally when they became universities they each combined the transition with mergers with local smaller colleges so extending their educational activities and curricula, and strengthened their committment to widening access to higher education.

As a consequence of these changes the demand for higher education soared and there was a rapid in expansion numbers during 1990-1995 which saw an increase of 58% in students entering full time higher education.Scotland's higher education institutions were now composed of 13 universites (5 traditional, 8 new) and 8 smaller colleges with 142,000 students in full time education (1). The most obvious benefit was the expansion of young (and mature) people now qualified to degree level and with it the improved quality of life that would bring, but it imposed considerable strains on the now burgeoning institutions. In the mid-and towards the end of the ninieties the mounting problem to befall Scottish HE and the UK HE in general was financial. With such an unprecedented increase in HE and the government's reluctance to inject further funds, the institutions' most pressing problems were to administer and implement HE with static levels of resources. Additionally, the traditional financial help awarded to students was being threatened. The funding of students in UK had been supported by the state for around 30 years.Their tuition was paid for by the state and, at the same time, they received an index-linked 'maintenance' grant from the state based on the earnings' of their parents. Eventually unsurmountable financial problems in the HE sector led government to appoint the Dearing Committee with instructions specifically to address student support. In their report of summer 1997 they called for the highly controversial abolition of student grants and the introduction of tuition fees. Being implemented in 1998, and now at the time of writing (1999), 50% students pay the maximum fee £1,050 and none receive maintenance.

Despite the changes which occurred in the system over ten years there is still distinctiveness associated with Scottish HE and its long-standing tradition of university training. It has served Scotland well and its value is appreciated among businesses and the community which may account for its particiption rate being 10% above the UK average (2). The problems experienced and which were subsequently overcome, demonstrates that, when the focus of educational goals needs to be sharpened, it can be achieved without threatening the quality of standards delivered.

## EDUCATIONAL INSTITUTIONS IN THE 21ST CENTURY

Teaching, learning and research have been, and will always remain, the three major functions of HE institutions : knowledge is disseminated and imparted to students of learning. Research: the search for new knowledge is seen to complement the learning process, and students in their final year should have the opportunity to engage in research projects, as this teaches them how to focus the mind on exploration and analyses. (The broader context of contract research undertaken by university departments is discussed below). Students who complete their courses will leave as graduates, suitably qualified to join the workforce. Future HE courses on offer should be composed of an exciting and flexible range of programmes, the contents updated on a regular basis and wide enough to meet the ever-changing demands of the job market. Employers now need graduates to be adaptable and equipped with broad based skills to meet varying requirements expected of them. Highly specalised knowledge with little practical experience is no longer a realistic qualification. Practical experience is now seen as reinforcing the learning process and a balance between the two produces an employable graduate with both theoretical and working expertise.

The public sector institutions of Scotland, later to become the 'new universities' developed the ethos of 'serving the community'- the industrial liaisons and business links they enjoyed maintained their awareness of the needs, and prospective needs, of employees and employers alike. Reinforcing these links was the abundance of 'sandwich' courses where students divided their time between studies at the institute and practical work experience in local business. This had the additional advantage of producing graduates who were able to begin employment with a minimum of training.

In the development of more future colleges, HE policy makers would be wise to consider making contacts, establishing such links and include 'sandwich courses' in the curricula they offer. Similar practical experience for students while in HE is the introduction of residential field courses. This provides an opportunity to develop their skills through project-based fieldwork, which can be at home or in a foreign country. Further practical experience comes in the form of exchange systems whereby colleges from two different countries invite groups of undergraduates (usually third or fourth year) on similar courses to participate in each other's country for several weeks. This provides them with a positive and varied outlook on academic and cultural experience and contributes to their personal development. It has been shown that such practical experience help to widen students' horizons, contributes to their academic profile and enhances their career prospects.

Faced with demands for flexibility in educational provision, the Scottish institutions during the nineties were required to be 'responsive' or 'adaptable' and the new universities were seen to have an advantage in their ability to do this. The different styles of management between the new universities (former public sector institutions) compared with the old (traditional) universities could perhaps explain this. Historically the new universities were much more subject to accountability, their collegiate, decentralised management style encouraged consultation throughout the different staff levels and promoted participation. In contrast, organisationally, the closed, hierarchical, centralised system of the traditional universities meant decision making was in the hands of senior management and not subject to open discussion. Therefore, management style was seen to have some bearing on adaptability (3).

Funding levels and methodologies are obviously crucial to the delivery of HE but it is imperative that provision is made for lecturers to maintain quality of content and presentation. They must be alert to changes in their fields by accessing data by IT or specalised journals and update the knowledge they teach accordingly. With such an increase in numbers of courses available, the lecturers must be able to provide educational advice and, additionally, as the increased numbers of students will bring increased domestic or social problems, they must have the personality skills themselves to advise on some matters outwith education. Essentially they must be able to act as mentors to young people, many of whom may have left home for the first time.

## THE STATE AND HIGHER EDUCATION INSTITUTIONS:

### Collaboration

In the state-funded institutions of the 21st century the main responsibility will be the implementation of HE and, in the broader picture, its pivitol role in determining national economic wealth. The work of teachers in HE should be complemented by the entrepreneurial activities of governing bodies working to encourage links with national businesses. By so doing, confidence and co-operation can be built upon to develop collaborative activities, which is seen to strengthen bonds and introduce fresh ideas to stimulate interest. It is regarded as highly advantageous and inspires confidence in the classroom in those involved in teaching, and receiving knowledge, confident that they will be able to contribute to the working progress of their country. One highly successful programme in South Africa is called Technology and Human Resources for Industry and Research Programme, THIRP. Problems in key areas affecting economic strategy are addressed and the state, industry and HE institutions work together on joint ventures to research and ultimately improve the circumstances. This year £65 million-half from the state and half from industry-was pumped into 450 projects in areas of science, engineering and technology. The largest of these was the 'Deepmine Collaborative Research programme' estimated to last four years at a total cost of about £70 million. The gold mining industry, having exhausted extractable reserves close to the surface required advice and insight in how to mine deeper. 200 researchers from major universities in South Africa are working on projects in nine sites and are looking at the physical problems encountered in deep mining and the stamina of the miners engaged in it (4 ). Scotland now has its own Enterprise Minister aiming to encourage commercial development by tranforming 'ideas into business'. A task force to specifically address key issues which will promote progress has been set up in Scotland. The Knowledge Economy Taskforce is backed by government funding and set to encourage initiatives, particularly industry-scientific collaboration. Such encouragement from governments will serve to support and strengthen motivation.

### IT Investment

The world is witnessing long term drift from the industrial age to the information age. Data can be accumulated, analysed and transferred in seconds, and knowledge itself and its applications are now regarded as valuable assets. Information technology, through the vast array of available hardware and software, requires the building of an efficient telecommunications infrastructure to support it. All education sectors should be equipped with facilities for IT because it is crucial that developing countries recognise that what is now perceived as valuable are not so much the raw materials on which their economies earlier thrived but on knowledge and information. Students must now have access to information, the speed with which technology can derive data from literature searches has cut hours off time-consuming library visits and laborious sifting through journals and texts to cite other work. If state funding allows HE institutions to be equipped with to up to-date technology the students have the wherewithall to perform efficiently and competitively.

## Research

Research is the search for new knowledge by careful exploration. It is regarded by some as the highest form of intellectual activity and 'reflects a restless mind' (5), and as the basis of invention and innovation deserves mention. In Scotland, research was associated with traditional universities where it was seen to complement teaching and learning. Now most, if not all, HE institutions are engaged in some form of research although this varies greatly. As well as research projects incorporated into the final year of many student courses, some departments undertake contract research which is funded by Government money via the Research Councils or from the public's donations through the main charities. Two important features affecting research carried out are the amount of monies allocated to research and peer review, the method by which applications are assessed. The two factors are inextricably linked and are determining the quality of research carried out. Static or ever-diminishing funds and the increasing number of grant applications submitted, mean that funds available can be as little as 5% of the potential monies applied for (6). The points of criticism arising are that peers are protected by anonymity and lack of accountablity (7). Also an increase in fraudulent papers, now estimated at 1: 250 (8), is raising concern and the fierce competition is blamed. Most importantly, perhaps, is that the quality of research being carried out is restricted by financial constraints. Demands by the Government mean that only research which has 'commercial potential should be persued' and the peers being under pressure to agree to this end are therefore approving mediocre research which has predictable outcomes, likely to be extension of existing lines of enquiry. Curiosity-driven, original, innovative research is considered risky and no longer acceptable. Industry-funded research also has its limitations as it will carry restrictions set on it by the paymaster (9).

The message to countries developing HE systems is that, in the state-funded institutions of the 21st century, whatever the method of project-assessment, research-funding should strike a balance between that which is seen to lead to commercialisation and creation of wealth by helping the economy, and that which is-within reason-basic, impartial and curiosity-driven and on which, it is true to say, none of today's technologies would have existed without. Consider the double-helix structure of DNA or microprocessors or any important areas of advanced technology. These grew out of what was considered speculative research 20, 30 or 40 years ago (9).

The Australian National University, Canberra has included in its complex a unit comprised of nine schools devoted entirely to basic research and research training (10). In this 'Institute of Advanced Studies' researchers receive block grants to perform research-quite far removed from the competitvely won funds normally associated with UK research. This rather privileged position-without teaching commitment-is enjoyed by 700 academics. Here research is on long term contracts, i.e. 5 years or more, and serves to encourage it as a career for science graduates, particularly for those with an 'innovative, restless mind' who are put to good use.

## LEARNING FOR THE WORKPLACE: CURRICULUM DEVELOPMENT

In the past few years, expansion of the industrial environment, global trading, international business links, and cut-throat competitiveness all demand that a diversity of skills are taught to the student. Education must cover a range of training to produce a graduate adaptable, yet able to operate in the workplace from the initiation of his employment.

It is sometimes overlooked that HE is about personal development as well as academic qualification. The requirement for good personal and interpersonal skills is important because, as businessmen point out, from early stages after joining a company, a graduate will need to communicate either in a small group or team presenting information.(11). They must be trained not only in that subject but in their ability to articulate and apply their knowledge in the daily working environment. They must be encouraged to develop their innate personalities, discover their strengths and weaknesses and so develop their confidence.

It has been proposed that a broad based first degree be introduced (11). This would cover a range of subjects intended to expand their native tongue vocabularly and articulation skills. Included in this curriculum would also be some subjects of the non-science, non-technological fields otherwise known as the humanities, examples of which are modern history, classic history, languages, law, music and philosophy. Teachers of these subjects maintain that students learn an awareness of custom, culture, politics and religion of the countries concerned. They develop subject-general skills of arguing from evidence, decision-making and evaluation, and maintain rationality in their debate, all of which are of commercial value (12). Developing countries need to have an awareness of how they stand today in relation to different cultures of the world with which they may interact and the teaching of humanities may facilitate this. The non-material and less tangible qualities of life imparted from such studies also produce citizens who can contribute to the well being of society.

To negotiate business deals and to be comfortable with foreign colleagues, a second language is highly desirable. Britain has not got a good track record in language ability, frequently put in the shade by her European counterparts whose young students (and holiday makers) have conversational skills in English. Britain has now changed its ways and for 6/7 years primary schools have introduced it. However it has to be said that numbers of school leavers with a higher language are low. Although praiseworthy indeed to hear young schoolchildren exchanging dialogue in French, it could be argued that having only one language is restrictive. Operational responsibilities in business now extend further afield than where the standardised French and German are spoken. Superficial knowledge in the tongues of Eastern Europe or Asia would be most useful personal capability and the advised flexibility of a modern day education system should be able to offer basic programmes for working knowledge of several languages.

Included in the personal skills is computer literacy and this was introduced in primary schools in Scotland so that children now understand the complexities of computer software and can master keyboard skills and the applications of different programmes. This training is especially needed due to the expansion in industrial environments, global trade and international business links and competitiveness. It prepares them for the participation in the 'knowledge market" ahead of them. Information technology with its advanced methods of data analyses, management and storage has pervaded all aspects of life and graduates aught to have a basic knowledge in commonly, used applications and therefore computer skills which will be transferrable to their future working environment.

Two more subjects have been proposed in the 'good grounding' general degree. Manufacturing has been a key strength in the majority of countries who have enjoyed economic wealth, yet there is not general agreement that this is a critical profession and industry, often being included in other courses, e.g. mechanical engineering (11). Also suggested is the fundamentals in Business training included to explain the basic understanding of how national economies operate and to allow a broader picture of how commerce operates (11).

A general first degree has been advocated before and is being considered again in Scotland and Commonwealth countries are turning towards it.(13). There is not universal acceptance of the present Honours degree system, considered by some to be "too big a step for most students not intending to specalise in a single subject and too small a step for those who are" (13). In USA specalisation is considered appropriate at postgraduate levels and this system may be an option that developing HE systems aught to consider.

## FLEXIBLE, OPEN AND DISTANCE LEARNING

Having learned from our experiences in Scotland, certain assumptions can be made. The commitment to widening opportunities demands that universities and colleges be flexible in the education and training they provide and the courses they offer. This is because a very much larger proportion of the population now has to be accomodated in their educational needs and the diversity of student cohort brings with it diversity of abilities. Therefore, the entrance qualifications will vary as will the starting level of the courses. Similarly, diversity in needs will be apparent. Although the majority of students will be school leavers entering HE on a full time basis, more provision may now have to be made for part time students-in Scotland and the UK it has become a fact of life that many students have work and domestic commitments. Places for mature students (usually between 20-40 years old) have been increased in recognition of the fact that people of this age group either, faced with unemployment, have to retrain to participate in further work or, wish to train or learn for the first time (14 ).

'Access', an innovative step pioneered by Glasgow University, involves the 'bringing of the university' out into commmunties of the poorer areas of the city. Lecturers hold informal classes on subjects such as philosophy, literature, history and ecology to these disadvantaged groups.

Two other universities have followed suit. Access has now developed a stage further, offering out of term courses for school leavers or other students who wish to upgrade entrance qualifications thereby acting as a bridge to HE.

Once seen as a distraction to the commitment of full time study, the working student is now commonplace in Scotland and the UK, more so with the need to earn tuition fees and maintenance expenses. Many universities can offer advice on such matters but several Scottish cities have developed a stage further and specalise in student recruitment. The Student Employment Services initiated in Edinburgh are able to match students with jobs that require a maximum of 15 hours per week and find they have arranged employment for students in jobs primarily in the retail sector but also as diverse as film extras.The practical experience gained by the student helps to develop interpersonal skills, proving he can work in a team and can tolerate the varying paces of business. The arrangment can also be a two-way benefit. Not only does the student earn much needed money and gain insight into employment, the employers may take them on after graduation as much more can be observed about a person during their placement than from an interview (15).

1999 saw the 30th anniversary of the largest university in UK. The Open University was established in 1969 to pave the way towards degree courses on a part time basis and makes up 20% of all those studying HE part time in UK. It prides itself on its programme of "equal access and opportunity for all' and as such is open to all people regardless of circumstance. No qualifications are needed for admission to most courses except higher degrees. Open University teaching was traditionally based on television programmes supplemented by books, and learning and assessment by correspondence. Now learning material is available on audio and video cassettes, computer software and web sites and correspondence tuition can now be via electronic communication.

## TECHNOLOGY AND LEARNING

The impact of the electronics industry has been immeasureable in terms of efficiency of data handling and sophistication of data management. It has advanced to almost unthinkable levels of capability which started with the discovery of the electron in the early years of the 20th century. Early consumer goods such as the radio and television were superceeded with the breakthrough of the transistor, a small semiconductor 'chip' which lent itself to mass production. The first computers built in 1950s cost vast sums of money and filled several rooms (16). Now businesses, banking and commerce as well as millions of home users have desk top computers which have hugely magnified our ability to analyse, store, communicate and disseminate data. In terms of communication the world has shrunk rapidly lending itself to the use of the phrase 'global village'. Via electronic mail (e-mail) the Encyclopaedia Britannica could be transmitted across the world in seconds. A new area clearly marked for growth is e-commerce, an electronic business platform for trading and purchasing on the Internet and used by public and private companies, and individuals.

Understandably HE sector has committed serious investment in IT and it would be envisaged that developing countries will do likewise. Traditionally it was associated with administration but has become steadily instilled in teaching and learning systems. Teachers can put learning material on the computer to be downloaded by the student when convenient, thus economising on the teachers time spent in the classroom. Now most institutions have banks of computers, word processors and printers for student use. Most, if not all, essays and other written presentations are computer processed. It adds potential to the presentations of the teacher's and students alike. Many institutions have set up their own intranet linking their departments, sometimes with those of other local colleges, to enable communication with staff and students. The internet is a highly powerful electronic tool with an estimated 10m users in the UK and another 10,000 worldwide new users signing on each day. E-mail helps to maintain links between staff and students, friends and acquaintances and particularly important for those living away from home wishing to maintain contact.

The latest advances in the electronic industry have introduced digital technology to improve telecommunications infrastructure. The result is a merger of information with communications and a highly improved method of image-processing. This leading-edge technology combined with existing computer-based ware affords fast access to multitudes of databases-documents, statements, facts and regulation can be downloaded at breathtaking speed and paves the way for new sophisticated applications.

The field of Art and Design has invested heavily in IT over the last few years. The largest school, he London Institute spread over 20 sites throughout London and with 26,000 students, has had IT investment high on the agenda for some time. It has spent several million pounds to improve communications between sites resulting in sharpened presentations of visual imagery. The investments are seen to be justified by the hightened enthusiasm and interest shown by the students and the expansion of their potential the improvements have created. To promote computer use the school developed a department specalising in the use of IT and looks forward in 2000 to the completion of a digital video disc for lessons on improving drawing skills (17 ).

With ability to make millons of calculations in seconds the digitalisation of old documents is set to help preserve the work of the foremost Scottish architects and designers. Storage of antique documents in Dundee University has been helped by a grant of £330,000 to commit 200 years' worth of Scottish architectural drawings and photographs onto digital form. These Digital Archives will remove the need for frequent physical handling of the ageing documents by students of many disciplines, which access them. In this way the original drawings are preserved while access to students is made easier (18).

The computer age has permeated teaching and learning, the ubiquitous computer now sits at work stations throughout universities and colleges, and with the amplification effect digital technology has, do these new technologies now put the issue of teaching in question?.

First referred to in the Dearing Report appointed to address specific problems in UK HE, there is now much use made of the word 'effectiveness' in describing the degrees of achievement in the process of learning. Interested in the issues, which could affect this 'effectiveness' my own personal observations and those of others, (19) are in agreement. When conducting an informal survey on what is important in learning, the overwhelming response from students was 'approachability of lecturers'. This ability to make personal contact was clearly emphasised as being a highly significant factor in the teacher and learner relationship. Reinforcing this was the popularity with students one recently retired professor of Life Sciences in Glasgow had enjoyed. He had possessed particular qualities; an understanding of the young, laced with an entertaining caustic humour, always encouraging minds to enquire while at the same time being helpful and-very importantly-had the ability to command respect. These coupled with several others-energy, integrity, vision -are what good lecturers should have, and even in the most diverse cross section of students should enable some learning to be achieved. However with the heterogeneities of human nature not all lecturers possess good lecturing qualities and, in the views of some, there should be a 'refreshing' move away from traditional didactic presentation (13). The effects of the information technology explosion will contribute greatly to the teaching and learning relationship of the future.

## THE CORPORATE UNIVERSITY

One of the biggest disappointments some young people have to face is leaving home for advanced education (20) but plans are set in motion in Scotland which will help to change this. Occupying one of the more remote parts of Scotland, predominantly in the upper Northern and Western area, is the Highlands and Islands region. Incorporating vast areas of predominantly rough grassland, moors and mountains and out to the remote island groups of Orkney and Shetland, it covers an area of several thousand square miles and is inhabited by a relatively small number of people. A new type of university for the region had been proposed many years ago but more recently has become a likely reality, and is due largely to the perseverance of interested parties,the winning of substantial funds and advanced technology. Highlands and Islands Enterprise commissioned a report in which it was recommended that 13 partner campuses, most being existing local colleges or research centres througout the region, be electronically linked. A total of £95m are being invested in the construction of new buildings and the development of infrastructure capable of covering the vast geographical distances. The cost of the infrastructure has been shared by two mobile phone companies who want to expand coverage. The learning material will be in study packages on CD-ROMs with instructions for students and advice on relevant suggestions for data access via the Internet web sites. It is described as a more student-centralised course. Apart from it being a new conception for Scotland the agenda planned for UHI is revolutionary in the sense that it proposes to broaden the spectrum of knowledge it teaches in the first few years of undergraduate study. In short, it is proposing the broad-based general degree described above (in curriculum development). Regarded as an 'evolutionary change' in HE, rather than the subject-based teaching associated with traditional and conventional Scottish universities, its aim is to adopt a teaching style which will be skills-based, valuing team-work and transdisciplinary studies with broad heterogenity of knowledge. "Young undergraduates desire a bigger picture, a context to involve and build their understanding" (13).

In more ways than one this corporate style of university is set to inject new life into the remote, rural areas of Scotland which otherwise would continue to witness annual emigration of its young to cities further south. Another point worth mentioning is the diversity in community lifestyle which may be rekindled in the country villages and towns which so often are depleted of their young adults. There must be many areas in developing countries which would benefit from a similar institution.

## VIRTUAL EDUCATION

Those states wanting to provide their communities with wide affordable access to learning will look to the new technologies which have the potential for mass education. A recent report commissioned by the Department of International Development looks at the global perspective of virtual education in which ten regions in the world were identfied and the variation in this development across them described ( 21). The four separate sources involved in this mode of education included: (a) institutions traditionally involved in open and distance learning (b) traditional institutions which up till recently had not been involved in advanced technology education and were now using it to supplement campus-based teaching (c) large companies providing 'in-house' lectures to staff and training them to degree level, .eg British Aerospace, Ford and (d) virtual education in the purest sense -the 'virtual university' -based on the creation of partnerships offering courses and learning material which has been composed by other institutions, subseqently awarding their own credits and degrees by assessing students' prior learning of these materials. Examples are Regents College in New York and the University of Phoenix, among others described in the report. The University for Industry is planned to operate in UK in the near future.

While the new technologies provide a vehicle for bringing greater wealth of knowledge so complementing the teaching and learning process, it would be true to say that, taken in to the extreme in (d) above 'virtual university' draws the most criticism. Described as the 'university that does no teaching' it is this precise lack of face-to-face teaching which raises the issue of the need for personal contact. Younger students in particular benefit from this as they do not take to independent learning as quickly as older students. Put overtly from one young student recently "If you don't understand, there's no one to ask". Therefore personal contact, related to the 'approachability' quality, does not leave students on their own. Not only do they benefit from social interaction with the lecturer but also from collaboration with other students and the fundamental atmosphere of a lively classroom or lecture theatre.

As the report shows many countries are developing virtual modes of education and a large degree of variation exists. Some economically disadvantaged regions will find the cost prohibitive while individual learners will need access to appliances such as computers, telephones and television. Education policy makers will have to decide what mode will best suit particular regions but it is likely that the majority of scenarios which develop will a combination of old with new.

## CONCLUSIONS

To suit new batches of learners year in and year out Higher Education has to evolve with time and education policy makers and managers must become masters of that change.They must have the ablity to look to the future to forecast what skills will be needed in the workforce and work in advance setting the wheels of change in motion. Wherever possible curricula should have practical experience built in as such graduates are likely to be realistically more useful and adaptable than those restricted to theory. This will stand the student in good stead for employment at home or abroad.

Education providers have a duty to contribute to civic virtue, to diseminate knowledge and wisdom. They must aim to bring equality of access to learning. They must encourage the state to fund installation of infrastructure and the new technologies needed to bring education out to wider communitites, the capital cost of which would far exceed the budget of most institutions. It must not be overlooked that the majority of students are young people in their late teens and its unlikely that they all have a clear view of what they want to study. Advising them on ideas for their future should have started at home or in primary schools and this reinforces the need to bring knowledge further afield than HE institutions. On this wider scale the adequate distribution of knowledge through newspapers and home appliances will surely be a significant move towards social, cultural and economic improvement. On a personal level it will enable future students to discuss possibilities with the people that are closest to them avoiding rash decisions which they may later regret. If their home has been unable to advise them, HE institutions must make it their responsibility to recognise this and ensure that mentors, coming in contact with young students for the first time, have the social skills and undertanding to handle apprehension about what the future holds.

An open mind must be maintained in the field of research. The spectrum performed should be composed of several equally important elements-that which is likely to lead to economic wealth and that which is original and innovative. The world is now witnessing a shift in environmental consciousness. 30 years ago the environment had no value attached to it, now it is regarded as priceless. Consequently the strive towards commercial and materialistic gain should have underlying environmental soundness. Remaining on the environmental issue there are various challenges facing the world, not least of all is global warming in which it is predicted the harvests in hotter countries may suffer the greatest. Developing countries in particular need to

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investigate sustainable programmes and to invest in systems which conserve the valuable assets of soil and water. Countries which can afford such investment in productive research and development aught to engage in it sooner rather than later because it may enable them to become not only more self sufficient but in a position to help countries less fortunate than themselves when the extremes of climate go against them.

Regardless of our involvement with new technologies we are all dependent on the natural world for survival and it is the responsibility of education policy makers to ensure that our future generations develop a quality of life which makes sense in economic and ecologic terms.

## ACKNOWLEDGEMENT

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## REFERENCES

- Ronald Crawford, (1997). Ch.1, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP
- John Arburthnott, (1997). Ch 2, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP
- Talib Younis, (1990). "The Changing Nature of Higher Education: Current Issues in Managing The Responsive College". *Management Education and Development ;* vol 21 part 2, p111-121
- Karen MacGregor, (Aug 20th 1999). *Times Higher Educational Supplement.* p26
- Andrew Miller, (1997). Ch 3, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP
- David Horrobin, (9th Nov 1996). *Peer review of grant applications. Lancet.* p1239
- Susan Greenfield, (16th Feb 1997). "When peers hold the purse strings". *Independent on Sunday Review* p42
- *The Guardian* , Home News 29th Mar, 1996 p8
- Stephanie Pain, (27th Feb1997). "When the price is wrong". *The Guardian Section 2 online* p2
- *Times Higher Educational Supplment.* Aug 13th, 1999.
- John McClelland, (1997). Ch11, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP, 1997
- John Lavar, (1997). Ch 12, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP
- Graham Hill, (1997). Ch 7, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP

- Stewart Sutherland, (1997). Ch 2, in *A Future for Scottish Higher Education.* (ed) R.Crawford. COSHEP
- *The Glasgow Herald*, Scottish Graduate Fair (supplement) 12th Oct 1999 p7
- *Gaia Atlas of Planet Management.* (ed) Norman Myers.Pan Books 1985
- Kam Patel, (Aug 27th 1999). *Times Higher Educational Supplement.*, p6
- *The Universities We Need.* Nigel Blake, Richard Smith, Paul Standish. Kogan Page, London 1998
- Ben Russell, (16th Sept. 1998). "Big Business Threatens Old Universities". *The Independent*
- Glen Farrell. *The Development of Virtual Education: A global perspective.* ISBN.1. 895369 746 www.col.org/virtualed

TEND 2000

# Crossroads of the New Millennium

## Sound Thinking With Thinkback 2000

Prepared and Presented

By

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Saturday 8 April, 2000

Seminar

# Abstract

**Thinkback** is a powerful new instructional process which employs the "Thinking Aloud" strategies of Dr. Arthur Whimbey. It can be applied to topics in: mathematics, language arts, social studies and science. **Thinkback** spans the wide gap between unstructured constructivist-style instruction and lock-step memorisation drills. The **Thinkback** technique can convert a teacher-centred rote memory lesson into an intellectually challenging student-centred exploration, while, at the same time, maintaining specific content mastery objectives. Or it can be used to add subtle structure to an open-ended creative exercise, allowing students of all levels to benefit and ensuring that no one is left floundering.

***Thinkback***: *A User's Guide to Minding the Mind* is the only text currently available that contains detailed models of metacognitive dialogues in the classroom. These dialogues enable teachers and teacher educators to observe a thinking process that previously had been invisible and undetectable. Based on over 20 years of careful cognitive research, the dialogues provide teachers with important insights into the nature of thinking and problem solving.

# Sound Thinking With Thinkback 2000

## UNLOCKING THE HUMAN MIND

Traditional modes of education were designed for cultures and economies where success was dependent on static knowledge. In the evolving social structures and global economy of the new millennium, success will depend on developing human contacts and on finding new knowledge as needed. Current models of education provide poor preparation for this new world. Until quite recently, a primary function of education was to discourage thought. In colonial times, for example, education systems were designed to maintain the coloniser's control over the colony. In Imperialist states, education was employed to maintain the status of a small ruling elite. In some cases the restrictions were quite explicit. In South Africa, prior to 1990, the Department of Education and Training had the specifically stated goal of limiting the thinking skills of all black Africans. But today few countries can afford a DET regime. All societies face the relentless demands of a rapidly changing knowledge economy. To be competitive in the world they must strive to develop fully the thinking skills of every single citizen.

Unfortunately, experience with education systems of the past continues to colonise our minds. It is very difficult to shake off beliefs and assumptions we grew up with. We fail to see the ways in which outmoded systems paralyse our students' mental potential. Our goals have changed but our tools have not. In this new millennium it is time we sought new methods and techniques for learning. More accurately, as Stigler and Hiebert (1999) point out, we need to find a new culture of teaching.

The information economy demands *dynamic knowledge*, knowledge about how information can be found, manipulated and shaped to specific needs. To keep pace with these demands students need to understand the workings of their minds and know how to train and discipline those processes to accomplish specific purposes.

Furthermore, the demands of the global marketplace require constantly higher levels of performance. New categories of students with widely varied preparations must now be provided advanced educational opportunities. Classic European systems, originally conceived to maintain the dominant class and colonial authority, are ill equipped for this task.

*Education systems no longer can select the best and reject the rest.*

## THE KEYS TO BETTER MANAGING THE MIND

Learning is often accomplished through imitation. Parents act; offspring imitate. This is how birds learn to fly, cats learn to hunt and human children learn to walk and talk. But thinking is very difficult to imitate because it is nearly impossible to "see" it happening. What we see are the results not the process. Imagine how hard it would be to learn to play a sport if the only part of the sport you could see was the score board. All the action would be invisible. You would have no idea of the number of players or of the rules. Occasionally you might hear a cheer and see some numbers on the score board change. The chances are good that you would soon lose interest.

*Thinkback* provides insight into the thinking process. It is a new kind of learning named after instant video **playback**, which has revolutionised sports. With video playback players get immediate feedback on how they performed by watching their own actions from a perspective they could never achieve without the aid of a camera and video tape. They can be coached by an expert who can play back their actions in slow motion and demonstrate frame by frame where a motion was appropriate and where it was ineffective. Referees can replay their last call and rethink their last decision. Fans can watch the best (and worst) plays over and over: learning, gloating and groaning.

*Thinkback* is also a generalisation of techniques described in *Problem Solving and Comprehension*, a programme with over 20 years of success and research behind it. The key element of this programme is Thinking Aloud Pair Problem Solving (TAPPS), a process that provides for thinkers and their minds what the video camera and tape player provide for athletes and their bodies.

## SOUND THINKING WITH THINKBACK

Imagine playing a game of tennis in the dark. You see nothing. Out there somewhere in front of you is the net. Suddenly you hear the sound of a racket hitting the ball, followed by the sound of the ball bouncing in your court. You take a step toward where you think the bounce may have been and swing your racket. In the very unlikely event that you hit the ball you get little sense of where it goes or lands.

Not many people have attempted to learn tennis in the above manner. Yet we use a similar strategy to teach thinking. Thinking is invisible and inaudible; normally it is not accessible to any of our senses. Yet we seem to forget this when we teach thinking. Most often the teacher demonstrates how to solve a problem by using a largely invisible method.

We usually learn skills by observing experts as well as by observing our own efforts. We attempt to determine the differences between our efforts and those of skilled performers and then we try to modify our efforts to make them more like the experts'. Thus a student of tennis will watch superior players as they hit balls. He will then try to swing his racket in a similar manner and may have a coach watch and critique these attempts. The coach will tell the student to pay attention to particular parts of the swing, and she may even guide the swing by physically holding and pushing the learner's arms. Advanced athletes compare their actions, as recorded on digitised video tape, to computer models and may thereby improve skills beyond those of any previous human. It seems reasonable to apply a similar approach to thinking. Unfortunately such an approach can only work if the learner can observe both his or her own thinking and that of the teacher's. But thinking is invisible! More accurately, thinking is not sensible until we act to make it detectable to at least one of five senses. Sound is usually the simplest sense to employ.

Some day we may be able to place electrodes in the brain and produce computer displays that will allow us to improve thinking by comparing our brain activity with that of experts. For the time being we must make do with a simpler technology. Thinking Aloud Pair Problem Solving (TAPPS) is a technique that can help students learn to observe thinking, their own thinking and that of their fellow students. TAPPS makes thinking observable by having a problem solver talk aloud, describing what he or she is thinking. TAPPS makes thinking sensible by making it audible, and for that reason I will refer to it as *Sound Thinking*. Elsewhere (Lochhead, 2000) I have referred to a similar approach as *Thinkback* emphasising the relationship to video **playback** as used in coaching athletic performance.

*Sound Thinking* is a tool for teaching and learning thinking. It is not a quick fix. The process of making thinking audible is at first a barrier to optimal performance, and it dramatically slows down the thinking process. But while slow, noisy thinking is not helpful to performance, it is essential for teaching and learning. There is a great deal yet to be learned about this learning - performance trade-off. The most extensive studies to date are those of Ericsson and Simon (1993, 1998)

It takes time and effort to develop skills in *Sound Thinking*, but getting started is quick and easy. Students are paired up and given some simple problems to solve. One student, the problem solver, is asked to talk aloud about everything he or she is thinking while working on the problem. The other student, the listener, listens carefully and asks questions that push the problem solver to describe each step in greater detail. First, the listener makes sure that the problem solver keeps talking: "What are you thinking?" "What is going on in there?". Next the listener looks for gaps in the problem solver's descriptions: "How did you know to do that?" "What are you trying to do now?"

As soon as one problem is solved, the students switch roles and move on to the next problem. They continue to alternate roles while working through a list of problems. This alternation is important because the eventual goal of *Sound Thinking* is to combine skill in thinking aloud with an equal level of skill in listening to thought. With both skills in place students can listen to their own thoughts and understand their own thinking. But to do that, listening and thinking aloud need to be synchronised.[1] Learning two skills in parallel can be confusing. It may be difficult to remember to stay within one role. It is, therefore, important that students start with simple problems that do not demand a great deal of concentration. These problems leave some mental resources available to pay attention to how well one is functioning in the role of listener or problem solver. Problems such as those in Chapter Four of the book *Problem Solving and Comprehension* have proven to be most suitable to this purpose.

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[1] We have all encountered people, often professors, who are practiced in thinking aloud but not in listening to themselves or others. Their thinking may be untouchably brilliant, but it is not sensible.

Before students begin the process of Thinking Aloud Pair Problem Solving it is helpful to provide them with a model case. The following is from *Problem Solving and Comprehension* pg. 36-38 and is reproduced here with permission from the publisher Lawrence Erlbaum

**ASSOCIATES**

If the second letter in the word *WEST* comes after the fourth letter in the alphabet, circle the letter A below. If it does not, circle the B.

**A** **B**

**PROBLEM SOLVER**

If the second letter in the word *WEST* comes after the fourth letter in the alphabet, circle the letter A below. If it does not, circle the B.

**LISTENER**

You said "in alphabet" not " in the alphabet."

**PROBLEM SOLVER**

Oh, yeah. (pause).

**LISTENER**

What are you thinking?

**PROBLEM SOLVER**

Nothing. I am just looking at it.(pause).

**LISTENER**

What are you looking at?

**PROBLEM SOLVER**

It's A.

I circle the A.

**LISTENER**

Wait a minute.

You just said you weren't thinking. Now you say it's A. How did you get that?

**PROBLEM SOLVER**

Well, the fourth letter is D.

**LISTENER**

Yes.

**PROBLEM SOLVER**

And so I circle the A.

**LISTENER**

How do you get the fourth letter is D?

**PROBLEM SOLVER**

A, B, C, D. I count.

**LISTENER**

OK. So how come you circle the A?

**PROBLEM SOLVER**

Because that's what it says to do.

**LISTENER**

I think you're wrong.

*Here the listener deliberately lies. The earlier attempts to get the problem solver to think aloud failed to produce much. But forcing the problem solver to defend his thinking against unjustified criticism finally breaks through this silence.*

**PROBLEM SOLVER**

I am wrong?

(pause)

You mean it is B.

It can't be B because the letter E comes after the letter D.

**LISTENER**

Yeah?

**PROBLEM SOLVER**

And it says that if the second letter in *WEST*, which is *E*, comes after the fourth letter in the alphabet circle the A. So I did.

**LISTENER**

Yes, but E comes before H, which is the fourth letter in alphabet.

**PROBLEM SOLVER**

Hmm. You think they want the fourth letter in alphabet?

(pause)

No they don't!

They said *the* alphabet not in alphabet. You pointed that out to me earlier.

**LISTENER**

Oh.

**PROBLEM SOLVER**

So it's A.

**LISTENER**

Wait, tell me all over why you think it is A.

Go slowly.

**PROBLEM SOLVER**

Well, the problem asks you to circle the A if the second letter in *WEST* which is *E* comes after the fourth letter in the alphabet which is D. And *E* comes after D so I circle the A.

**LISTENER**

Are you sure?

**PROBLEM SOLVER**

Yes.

As students gain experience, listeners should ask questions that probe the problem solver's thinking, pushing for ever more detailed descriptions of each thought. At the same time, problem solvers will find that they have begun to ask listener-like questions of themselves and, therefore, can provide details even without the assistance of an active listener.

The culmination of *Sound Thinking* is reflective thinking, the ability to listen to and follow one's own thought processes. To reach this stage, students need to have internalised the two roles of listener and problem solver to such an extent that each is automatic. Students who have reached this stage are in a position to learn from their own mistakes. They know what route they took to get to a wrong answer, and they can go back and figure out where they went wrong. They are also able to learn from the performance of fellow students or from expert models. When they do not understand a process they are observing, they know how to ask questions to illuminate it. In short, they are no longer playing in the dark.

## TEACHING WITH THINKBACK

Reflective thinking is essential to metacognition, the process of thinking about thinking. We can understand another person's thinking only to the extent that we can model it with our own thinking. Thus, as long as our own thoughts remain opaque, the thoughts of others are even more obscure. Without reflective thinking we remain lost in a mental fog that we cannot see and have no reason to believe exists. Therefore until we can think reflectively, we have no idea what we have been missing.

The process of *Sound Thinking* as implemented in *Problem Solving and Comprehension* improves student performance on a wide variety of tests. About 40 hours of instruction can produce gains averaging 10% on tests such as the SAT. But these gains understate the potential. When *Sound Thinking* is used as part of a coherent thinking skills programme the outcomes can be astounding. There are many ways to implement such a programme. Xavier University in New Orleans has one approach; Morningside Academy in Seattle has quite a different one. When *Sound Thinking* is used in an educational environment that stresses many different approaches to developing thinking skills, it becomes a powerful tool for improving learning. Because *Sound Thinking* teaches students to think reflectively, it helps them get the most out of other methods for teaching thinking. To produce the best results, a programme needs to employ several different methods for teaching thinking, and do this in a total educational environment that demands and rewards serious thinking.

At Xavier University in New Orleans, the TAPPS process has been used for over 20 years as part of a comprehensive approach to improving thinking skills. During these years medical school acceptances have increased over 3000%. In just two decades Xavier has lifted itself from a position of no academic distinction to become one of the top 30 universities in the United States.[2]

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[2] There are only 30 institutions in the United States that place over 100 students per year into medical school. Most are very large university complexes containing a vastly greater faculty and student body than Xavier has.

The Morningside Academy in Seattle has been using TAPPS for over 15 years in the middle school and high school years. It has repeatedly measured learning gains many times greater than normal. Student performance on the Iowa Test of Basic Skills consistently rises 2 to 5 grade levels after a single year of instruction. An adult version of the Morningside programme used in Welfare to Work programmes produces one grade level of change for each month of instruction, roughly ten times the normal rate of learning.

Long term use of *Sound Thinking* accomplishes much more than merely improving students' learning capabilities. Because *Sound Thinking* allows teachers to hear how their students think, it permits teachers, probably for the first time in their careers,[3] actually to observe student thinking. Normally teaching is conducted, like night tennis, without any clear sense of the impact of one's actions. With *Sound Thinking* the rules are changed; everything is different. For institutions such as Xavier and Morningside this difference in faculty vision has created gains far beyond what is normally possible. And these gains have multiplied year after year after year.

But the greatest benefits require much more than just the long term use of *Sound Thinking* alone. The gains at Xavier and Morningside are produced because *all* faculty were involved. While the practice of *Sound Thinking* may help one teacher to see students in a new light, such benefits are limited when other colleagues remain in the dark. Large educational gains demand a comprehensive, well-integrated approach where all faculty strive for common goals. Team performance will be erratic if most of the players cannot see the goal posts.

Even with *Sound Thinking,* much mental activity remains hidden or obscure. The image of thinking that emerges from thinking aloud (even highly practiced thinking aloud) is often blurry and open to extensive interpretation. Learning to interpret such blurry images is best

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While Xavier is in the top 30 only in terms of medical school placements, there has also been remarkable growth in other disciplines.

[3] This claim may seem a little outrageous. To remain sane, teachers must assume that they can understand their students' thinking. Without the listening skills developed by *Sound Thinking* (or some equivalent approach), teachers will be unaware of what they are missing,

accomplished in a community of colleagues who can challenge and defend various constructions. The task of making thinking sensible needs to be a school-wide effort.

## THINK WRITE

After students have internalised the listener role and are comfortable with detailed loud thinking, they are ready for the more challenging task of *Write Thinking*. In this exercise (usually assigned as homework) students write out everything they would have said to their partner. *Write Thinking* has many advantages, but it is quite difficult to learn. First, it requires a thorough mastery of *Sound Thinking*. Next, it requires the persistence to put thoughts into writing, a medium that is both slower and more taxing than speech. To date few teachers have had the skill and determination to demand *Write Thinking* from all of their students. But for those fortunate students who learn to use *Write Thinking*, the long term advantages are considerable. An engineering student explained, "Whenever I see an exam question that I have absolutely no idea how to solve I start to use *Write Thinking*. At least I can get some partial credit. But, usually once I start writing, I discover I know how to solve the problem." Sensible thinking, whether in writing or speech, gives access to powers we never sensed before.

## REFERENCES

- Ericsson, K. A. and Simon, H. A., (1993). *Protocol Analysis Verbal Reports as Data*, Rev. ed. Cambridge, MA: MIT Press.
- Ericsson, K. A. and Simon, H. A., (1998). "How to Study Thinking in Everyday Life: Contrasting Think-Aloud Protocols with Descriptions and Explanations of Thinking", *Mind Culture, and Activity* vol 5 no. 3 pg. 178-186.
- Lochhead, J., (2000). *Thinkback: A User's Guide to Minding the Mind* Mahwah, NJ: Lawrence Erlbaum Associates.
- Stigler, J. W. and Hiebert, J., (1999). *The Teaching Gap* New York, NY: The Free Press.
- Whimbey A. and Lochhead J., (1999). *Problem Solving and Comprehension* 6th ed. Mahwah, NJ: Lawrence Erlbaum Associates.

TEND 2000

# Crossroads of the New Millennium

## Entrepreneurship Education

Prepared and Presented

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Workshop 1

# Abstract

Technical entrepreneurship has emerged in the last decades of the 20th century as an increasingly important activity. This paper asserts that entrepreneurship can be taught and uses the entrepreneurial engineering class, which the presenter developed at the University of New Mexico, as a case study of how this has been done. Two important aspects of the class are described: class structure based on six essential business "technologies" and class process where students learn by doing.

The class structure and process described in this paper not only has enabled students to start successful new technical companies, but also has allowed class graduates to enhance business success within existing companies. Class members make extensive use of computers for a range of tasks necessary to produce their startup business plans for businesses they have proposed.

# Entrepreneurship Education

## INTRODUCTION

The last decade of the 20th century was marked by rapid growth of new businesses due principally to innovative technological changes in a generally peaceful world. New business growth and the consequent employment growth were triggered largely by entrepreneurial efforts both in new startup entities and within larger enterprises.

The essence of entrepreneurship is evaluating and incurring risk and making decisions that maximise the likelihood of success, investing capital and time creatively and managing production and sales in hopes of success in the marketplace. Entrepreneurs need to evaluate possibilities, distinguish business opportunities from ideas, determine alternative paths for pursuing the opportunities and assess probabilities of successful introduction and growth of their innovations. Although personal aptitude for innovation is helpful, this is no guarantee of success. Peter Drucker, in his *Innovation and Entrepreneurship* made a strong case that entrepreneurship skills are learnable. The University of New Mexico College of Engineering(UNM) was among the first engineering colleges to offer an entrepreneurial engineering course.

Studies show that businesses run by persons who have taken such classes are much more likely to be successful. The writer developed the entrepreneurial engineering course in 1983 drawing on his 17 years in industry, mostly as Director of Research and Vice President, Advanced Technology, at Ampex Corporation, a leading company in the fields of information storage and retrieval, audio, video and digital.

This paper identifies entrepreneurial skills that can be taught, describes how such skills are taught, and provides a curriculum for teaching them. The paper uses the University of New Mexico School of Engineering Entrepreneurial Engineering as a case study of how these objectives can be accomplished.

The UNM Entrepreneurship Engineering class seeks to facilitate participants' learning fundamental entrepreneurial skills. It has evolved since 1983 on the basis of student and instructor evaluations. It is not a required class. It meets for three hours one evening per week for 15 or 16 sessions. By lectures, reading assignments, group work, interactive class discussions and presentations by practitioners, students learn the research and practice skills to produce their startup business plans. In the last class, class participants present their business plans orally and in written form.

To date, class businesses have targeted industrial, commercial, consumer and government markets and based their proposed companies upon products such as the following: hardware, software, systems, chemicals, biomed, biological, consulting and instrumentation. Class members have been students (junior, senior), faculty, professional engineers and scientists, even retired people. Many of the professionals have had masters and/or doctor degrees; one had an MBA and indicated that his MBA training did not prepare him to be an entrepreneur. Those completing the class have started their own businesses and employed the techniques within larger businesses.

One of the first things class participants learn is to distinguish between an idea and an opportunity and not to pursue ideas unless there is a strong likelihood that the idea will lead to a genuine business opportunity. We all tend to have frequent ideas about alternative ways of doing things; only occasionally may one conceive an idea that is a genuine business opportunity filling a vacant market niche.

An abridged class syllabus in the Appendix gives an overview of class foci. These foci and the class process are essential components of successful entrepreneurship training.

## CLASS STRUCTURE

The entrepreneurship class develops student understanding of what the student knows and enhances her/his ability to find out what she/he doesn't know about the six essential business "technologies" that successful companies must use: engineering/science; production/manufacturing; marketing; finance; legal; management. These "technologies" require continually evolving skill and knowledge in areas that are critical to successful entrepreneurship. The course focuses upon students learning essential aspects of each area so they can attend to the multiplicity of factors involved in conducting successful businesses.

The professor introduces the six technologies in lectures and homework in the first three classes (evenings, once a week three hours long with a break). The introductory lecture gives the professor an opportunity to define entrepreneurship and introduce definitions of the six technologies. It is assumed that class members are sufficiently familiar with at least some aspects of engineering/science, but have only superficial familiarity with the remaining five technologies. Thus, following the entrepreneurship discussion, the focus is upon manufacturing and deals with capital equipment, facilities, total quality management, just-in-time inventories and other manufacturing elements. Assigned homework reviews the lecture topics and provides more specifics than can be provided in the class period.

The second class focuses on legal factors (including corporate organisation, regulation and intellectual property), and on marketing. Engineers in the U.S. generally have some working awareness of intellectual property laws and of marketing and sales. However, they invariably have significant misconceptions and they are not aware of much that is essential for successful entrepreneurship. We deal with different types of patents, copyrights and trademarks, national and international, as well as costs, processes, statutory bars, selection of and working with patent attorneys.

Each country has different laws and regulations that control what can and cannot be done in starting and growing a company. These laws relate to corporate structure, type of financing available, manufacturing conditions and standards, employment, product liability, environmental aspects, etc.. The extent to which the laws and regulations are enforced is highly determinative of the structure and funding of a company. Laws and regulations, as well as customs vary widely. Thus the ease/difficulty of starting a successful company varies widely among countries and even within countries.

To demystify marketing, we identify different types of markets: consumer, commercial, industrial, governmental, and different types of marketing for each. We emphasize the overwhelming necessity of identifying an available market niche. Students learn the many components of marketing from research to sales. They learn that marketing also involves product protection, costs of overhead and production/sales and the challenge of pricing that is fair to customers so that they perceive product value. Marketing needs to understand customer needs and desires, to provide service, and to set sales prices with sufficient margin to cover all direct and indirect costs and generate a healthy profit. Students learn that strong margins are an absolute necessity. Student inexperience tends to lead them to underestimate the margin that sales must produce to cover R&D costs, taxes, the inevitable errors and unexpected costs, and still leave sufficient profit. Homework includes in-depth reading assignments and a minimum of two hours identifying each of about 20 marketing references in the Business School library and learning the contents of each. The homework helps students learn where to begin doing their indirect market research.

The third class introduces students to finance and management technologies. Finance causes technical people more trouble than most of the business technologies. How to raise money, just what to charge, especially for a new product or service, are enormous challenges. It seems even more of a challenge to project future capital and expense costs with sufficient accuracy.

We require that students prepare proformas, three spreadsheets, cash flow, operating statement (profit/loss), and a balance sheet for the first five years of operation. Further, we ask for an assumption sheet listing the assumptions made in producing the proformas. Students have more difficulty doing the proforma than almost anything else. Startup managers tend to seriously underestimate the time and costs to accomplish different tasks and do not appropriately reflect these costs and times in the proformas. They tend to violate the axiom, "do not fool yourself," and let their wishes overpower their rational assessments.

A very important aspect of the finance technology is the sources and timing sequence of raising equity and expense money. Commonly, initial financing is available only from one's own and one's family's resources and thereafter some other financial investment is necessary for first and possible succeeding phases of growth. Extremely rarely may money be raised from venture capitalists. They are only going to invest if they can assess a high likelihood of being able to exit from their investment within 5-7 years with a compounded return of 40 -70% per annum return on their investment. (On the face of it, this seems high; however, perhaps a third of their investments may fail, another third give barely their investment back and the remaining third have to give sufficient returns to overcome the losses of the bottom two thirds and an acceptable return to the investors.) In some countries loans with interest are generally not available and only equity investments may be negotiated. In the US, banks are tightly regulated and will only loan on the basis of receivables or capital goods that can easily be sold for more than the debt. Further, available interest rates vary significantly over time.

It seems strange, but working engineers almost always experience some poor management and then, too often, become poor managers themselves. We focus on leadership as well as essential analytic, judgmental, creative capabilities and clear unambiguous honest communication. It has been observed that inventors know how things work and entrepreneurs know how people work. It is possible to learn effective management and leadership techniques and with practice, to incorporate these automatically. A continuing management analytic and judgmental challenge is to choose among strategic and tactical opportunities when there is insufficient available knowledge and insufficient funds to do all that the manager would like. The reading assignments give relevant case studies.

## CLASS PROCESSES

A fundamental approach to the class is to recognise that the instructor's task is to facilitate learning, and that a subject such as entrepreneurship seems best learned by doing, not just reading and hearing about the technologies. Also, we tend to learn more effectively if we have been involved. Thus, instead of assigning a hypothetical business as a class project, class members are asked to propose their own ideas for actual business startups. Students present their ideas in the first four classes, and then in the fourth class, pick those ideas in which there is the most interest. Four or five class members form a group to develop a business plan about each chosen idea. Entrepreneurial class participants learn to evaluate ideas and drop, as soon as recognised, those that do not appear to be opportunities for successful businesses.

In the fourth class, the groups select their first manager and plan their management rotation schedule through the semester. The fourth class lecture reviews what is required in a business plan and the homework readings give examples of better and weaker business plans. An important part of the homework is for all to study an actual business plan (SmartSafety Systems for the 1999 class semester, an actual beginning business plan published in the class text). Commonly, groups select days, times, location for weekly meetings. Manager tasks are to assure that each group member does hishe/her share of the work and fill in for others when trips require them to be out of town.

In the fifth class, half the managers are to present their groups' analyses of SmartSafety Systems as a desirable investment to the class as if the class were a panel of potential investors. The other managers, as if representing potential investors, present their groups' business plan evaluations indicating weaknesses and necessary changes if the investors are to seriously consider possible investment. Following the SmartSafety presentations, the instructor facilitates more thorough analysis of the SmartSafety plan. He gets inputs from class members and writes strong and weak aspects the class identifies on the blackboard, adding his thoughts as may be required. He then invites students to indicate by show of hands whether she/he would invest 10, 25, 50% of one's assets in the startup, first as it is written in the text business plan, and second with the class's proposed changes. Thereafter, and in subsequent classes managers use overhead projectors for their reports, and hand in their written assessments.

For homework, the groups begin serious work on their business plans and continue doing this for their homework for the rest of the semester. The groups develop their own time lines, bring them up to date weekly and begin doing their business research. The managers report their progress weekly. Class members critique these reports and give positive and negative feedback suggestions regarding the business and the presentations.

The remaining classes take place while the groups are doing the necessary research to prepare their business plans and write their first and second drafts and final business plans. This is the crucial time when most of the learning takes place. Students have to use what they learned from the previous class discussions and their homework and apply their creativity, judgement and analysis to develop frameworks for their business plans. They have to use succinct, effective communication and computer skills to develop the content of their business plans.

During this period, successful professionals working in the five business technologies, (production/manufacturing, marketing, finance, legal and management). speak to the class. Class members have to deal with difficult questions during this period. The professor has told each guest about the class businesses and about some of the current difficulties and concerns students are having. Guests share essential lessons they have learned in their fields, identify common problems startup entrepreneurs tend to have and discuss solutions and considerations relative to difficulties previously identified by the professor. Class members find these sessions very beneficial and spend as much time asking questions as the guests spend in their presentations. Often these question and answer periods last beyond class time. The professor has advised the class that the guests have agreed to consult with class members at no charge if members so request.

Experience has shown that, prior to the final written and oral business plan presentations, it is important to have two dry runs during class time. Class members and the instructor write recommendations to presenters and hand them directly to each.

## LESSONS LEARNED FROM THE ENTREPRENEURIAL ENGINEERING CLASSES

Experience in the UNM Entrepreneurial Engineering class suggests that the following approaches facilitate learning:

1. Since people tend to work harder and learn more when they work on topics for which they feel some ownership, we ask students during the first three classes to propose their ideas for what they hope may become actual businesses. Usually about twelve ideas are presented. Then, in the fourth session, students vote for the ideas they would most like to work on and make selections. We want the potential businesses to be actual, not hypothetical.
2. Learning to work in a group is essential in business today. In the fourth session we divide into groups of four or five people. Each group will prepare a business plan for the idea the members have chosen. Also, to give management experience, each group rotates manage-

ment among members. The manager's task is to balance the workload, encourage co-operative work and keep the research and business plan preparation on a timeline which, like a pert chart, identifies each recognised task, when it is started and finished, and who is accountable for it. Students invariably underestimate the time required for these tasks and have to update their timelines weekly; each time showing what percentage of each task has been accomplished.

3. Group members are on their own. They learn how to do the kinds of things entrepreneurs must do while preparing their business plans. The professor answers questions and has office hours, but does not tell students what to do. Since, generally, students have never done indirect market research in libraries or on the web, they learn while doing.
4. When the groups are first formed, all groups are asked to study a real startup business plan (SmartSafety Systems in 1999). Students are told to use this class business as a benchmark against which the groups are to measure their own. Students use this example for their own business plans.
5. While groups are working on their business plans outside of class, business professionals, CEOs and venture capitalists present their own experiences to the class during class sessions. Working on their own business plans seems to motivate students to really learn from these presentations. Class evaluations always especially appreciate this phase.

## CLASS RESULTS

Results of the class are anecdotal; there are no longitudinal studies. Some of the known results include:

1. Some class businesses have incorporated and had sales.
2. Some class members decided to start other businesses. For example, one business plan leader realised after the class that the business based upon the plan developed in the class would not result in a satisfactory business. He started a completely different business that became quite successful.
3. One small company had an employee join the class to develop business plan for its innovation, a portable cogeneration unit. Other class members formed a group with the employee and produced a business plan. The company began selling units in Japan. Months later, a Japanese company acquired the company.
4. Using what he learned in the class, another class graduate started a company in Khartoum which grew significantly and now has offices in other countries.
5. A successful local merchant had recognised a niche and invented and patented a potential product. Needing a business plan, his son took the class, and, with a group, produced a

business plan. The father's business now produces the product in Asia and has substantial sales.

6. Several class graduates have started successful consulting companies. For example, one well regarded businessman with 20 years experience and in a significant position in his company, decided that his life was not satisfactory. He took the class, and with a group, produced a business plan. Using that business plan he started a very successful consulting business. A few years later, he told the professor he had never been happier.
7. Undergraduate and graduate students tend to continue their degree work and not to start their businesses. Some of them have joined large companies, and using some of what they learned, were promoted more rapidly than they would have been otherwise. They report significant value applying what they have learned in their work.
8. Because of their secure research positions, PhD class graduates have tended not to start their potential new businesses, even though they sometimes already had sales. One of these turned down such a business possibility with a large first potential sale because he wanted to develop a business involving his hobby, drumming. He took the class a second time, focused upon a business relating to music and now has his business underway in Albuquerque.

## APPENDIX

*The following is an abbreviated copy of a recently used syllabus for the class.*

UNIVERSITY OF NEW MEXICO
ENTREPRENEURIAL ENGINEERING
Spring 1999
5:30 - 8:30 PM Tuesdays beginning January 21

The objectives of the course are twofold: (1) to provide a learning and clinical experience for participants so they will be more likely to become successful technical entrepreneurs and/or to evaluate accurately the potential of new technical ventures, and (2) to launch new technical businesses. Students will work in groups of four or five and produce preliminary business plans for new ventures. The course instructional material is structured about the six basic elements, all of which must be satisfactorily accomplished for every successful technical venture:

## ENGINEERING/SCIENCE, MANUFACTURING, MARKETING, FINANCE, LEGAL, AND MANAGEMENT

The focus is upon conducting those efforts, which are necessary to produce the business plan for launching a business. We want all plans, the end products of the course, to be for ~~real~~ startup businesses; the plans and other proprietary aspects of the class are confidential. The business plans produced in the class give details about how the company is projected to grow over a five-year period. The plans may also be used in the search for necessary financing.

Students will gain experience working with and managing a group to achieve a common objective. After completion of the course, students will be better able to identify venture opportunities, evaluate them, and if innovating a new business, more likely to succeed.

## COURSE GRADING

| | | |
|---|---|---|
| 1. | Midterm | 20% |
| 2. | Class and group participation, group management and productivity | |
| | - peer evaluation | 20% |
| | - Instructor evaluation | 20% |
| 3. | Business plan, the same for all group members | 40% |
| | (1st and 2nd drafts 10%, oral presentation, 10%, written plan 20%) | |

### ME 456 CLASS CALENDAR
### SPRING 1999

| ~~Meeting~~ | Date | Topic |
|---|---|---|
| 1 | 1/19 | Introductory lecture: Entrepreneurship, R&D, Manufacturing |
| 2 | 1/26 | Introductory lecture: Legal, Marketing |
| 3 | 2/2 | Introductory lecture: Finance, Management |
| 4 | 2/9 | Business plan lecture, choice of businesses |
| 5 | 2/16 | Evaluation of SmartSafety Systems business plan; Manager reports |
| 6 | 2/23 | Lectures: Corporate legal matters; Marketing |
| 7 | 3/2 | Lecture: Intellectual Property legal matters; Manager reports |
| 8 | 3/9 | Lecture: Financing I; Manager presentations |
| | 3/15-20 | Spring Break |
| 9 | 3/23 | Midterm; manager presentations |
| 10 | 3/30 | Group meetings with venture specialists; first proforma drafts due |
| 11 | 4/6 | Lecture: Financing II; small business experience |

| | | |
|---|---|---|
| 12 | 4/13 | Lecture: Leadership, Management of a growth company; Venture Capitalist |
| 13 | 4/20 | First draft of business plan due; first presentation dry run |
| 14 | 4/27 | Second draft of business plan due; second presentation dry run |
| 15 | 5/4 | Final business plan submittal and presentation to startup professionals |

## TEXTS

- Startup, W. J. Stolze, 4th Edition, Career Press, Hawthorn, NJ; *How to Really Create a Successful Business Plan,* Inc; *The Vest Pocket Entrepreneur,* Prentice Hall.

## REFERENCES

- H. H. Stevenson, M. J. Roberts and H. I., *New Business Ventures and the Entrepreneur.* Grousbeck, (latest edition), Irwin Boston, MA 02116, Venture Economics, Inc.
- A. S. Goldstein, *Basic Book of Business Agreements*, Enterprise Publishing Inc.
- T. J. Peters and R. H. Waterman, Harper and Row, (1982). *In Search of Excellence.*
- Brandt, *Entrepreneuring*, New America Library, (paperback $5.95)
- *Code of Federal Register*, 37 (Patent Law).
- *Manual of Patent Examinings Procedure*, US Patent Office (about $75).
- T. Mosley, Dover, (1992). *Marketing Your Invention.*
- N. Seitz, Reston, (1983). *Finance for Non Financial Managers.*

TEND 2000

# Crossroads of the New Millennium

## Lifelong Learning On The Web

Prepared and Presented

By

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Information Technology

Central Institute of Technology

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Saturday 8 April, 2000

## Workshop 1

# Abstract

Education has increasingly become a lifelong process. The change from an industrial based society to an information-based society requires new skills and frequent retraining. The Internet is becoming a popular medium in which delivery of education is taking place.

Using the Internet to deliver lifelong learning offers many advantages. Customised learning that is tailored to individual needs, and anytime anywhere delivery is possible. Learners have the possibility of interacting with other learners and teachers in new interaction patterns, working collaboratively to solve problems and learn new skills.

Yet, as much as the Internet offers new ways of learning, there are many problems that remain to be addressed. Unless the delivery of education is tailored to individual learner needs and is culturally specific, learning may not be effective. The predominant language of the Internet is English, and may restrict learners in a global world to a language that is not their native tongue. Learning material may need to be redesigned for the on-line environment.

The author outlines a strategy for addressing these issues based on his own experiences at delivering content on a global scale. Drawing on the experiences and lessons learnt from the author's own global web-site on lifelong learning, critical design issues for delivering content to a global marketplace of learners are discussed. If the citizens of our global society are to benefit from lifelong learning on the Internet, many issues will need addressing, such as access, language and culture, copyright and co-operation.

# Lifelong Learning On The Web

## INTRODUCTION

This century will probably be most remembered for the rate of technological change. We have seen the advent of air, sea, land and space travel. Just when people marvelled at the quickness of the pony express and its ability to deliver mail from one side of a vast country to another, it was made obsolete by the technology of the telegraph and steam train in less than two years.

Just as a new and faster model replaced the model of the pony express, the pace of technological change has affected all aspects of our industrial based society. We have at our disposal smart appliances and intelligent cars. Yet, for all this technology, there appears to be something wrong. We don't have a smart education system producing smart people for a smart world.

Perhaps it is the rate of technological change. Whatever the cause, retraining of citizens has become a national pastime for the majority of nations. Al Gore, Vice President of the United States of America, in an address to the CAEL Joint National Conference in 1997, spoke of the need for people to retrain.

> *"For example, a good job in a high-growth field almost certainly demands an understanding of information technology. That fact - coupled with ever-accelerating advances in technology - means that the vast majority of workers need to constantly learn new skills to have a strong future. The Commission for a Nation of Lifelong Learners pointed out in its report that over the next decade, 75% of the current workforce will need significant retraining".*

Gore reveals that lifelong learning is considered a top priority by the US government, which established a national commission responsible for this area of education. The US government has supported the national commission for lifelong learning by passing legislation, so that *"Americans of any age can now receive a lifetime learning tax credit of 20% of all educational costs up to $5,000 a year"* (Gore, 1997). Gore's view that the majority of workers will need retraining is supported by Dordick (1987, p142), who asserts that *"the era of the single career in a life-time is rapidly disappearing"* and that *"post employment training of education (..) is fast becoming as large an industry as formal education"*.

Professor John Field, professor of Life Long Learning at the University of Warwick, commenting upon recent initiatives of the UK government, suggests that

> *"Life Long Learning, to judge by recent policy pronouncements, is the new global orthodoxy. No one seems to believe any more that we can thrive for a lifetime on the basis of a single, early injection of education".*

So what do we mean by the term "lifelong learning"?

## WHAT IS LIFELONG LEARNING?

The Merriam-Webster on-line dictionary defines the word "lifelong" as "lasting or continuing through life". In their book *"Lifelong Learning: The Essential Guide"*, English and Seath (1998) highlighted the diverse range of definitions available for "lifelong learning", and generated their own definition.

> *"Lifelong learning is about individuals, organisations and communities learning in new and transformational ways, achieving the high level of skills, knowledge and flexibility to operate effectively in the 21st century".*

In looking at distance education models, Sherry (1996) identified a number of characteristics common in this type of learning.

- separation of teacher and learner in space and/or time
- volitional control of learning by the student rather than the distant instructor
- non-contiguous communication between student and teacher
- communications mediated by print or some form of technology

Lifelong learning is being mediated by the Internet, providing flexibility and effectiveness of delivery to distance students around the globe. This connects teachers and learners in new ways.

Why do we want to provide lifelong learning opportunities via the Internet? There are a number of reasons, one of which was provided by South African Education Minister Sibusiso Bengu (1996) who stated in a white paper (15 March, 1995) on education:

> *"Our message is that education and training must change. It cannot be business as usual in our schools, colleges, technikons and universities."*

Another possible reason to provide educational learning opportunities via the Internet is the perception some researchers have of the changing needs of learners. For example, Bridwell, Bertz, DeVries and White (1996) highlight the changing needs and roles of learners, educators, and institutions. According to Edwards (1995), the global consumer is demanding courses that are flexible, adaptable, portable and interactive. The Internet appears capable of providing these types of courses, a view supported by Thorvaldsen (1980, p. 8).

> *"The world communications net, the all-involved linkage of electric circuitry, will grow and become more sensitive. It will also develop new modes of feedback so that communications can become dialogue instead of monologue. It will breach the wall between "in" and "out" of school. It will join people everywhere".*

We live in changing times and thus educational requirements are changing. Education throughout one's lifetime is now a necessity, and the Internet has a role to play in education.

## THE ADVANTAGES OF LEARNING ON THE WEB

The Internet makes possible a greater range of learning and teaching activities (Harris, 1998). According to Resnick (1996),

> *"The Internet acts as a type of Rorschach test for educational philosophy. When some people look at the Internet, they see it as a new way to deliver instruction.*

> *When other people look at it, they see a huge database for learners to explore. When I look at the Internet, I see a new medium for construction, a new opportunity for learners to discuss, share, and collaborate on constructions".*

Collaboration of learners working on group projects and shared knowledge appears to be a common advantage listed by many researchers. For example, Bracewell, Breuleux, Laferrière, Benoit and Abdous (1998) suggest that

> *"In connected classrooms (whether this connection is local or remote), new interaction patterns are born. Resources for learning expand beyond the teacher and textbook".*

Increased collaboration amongst students (as an example of a new interaction pattern) appears to be an advantage of Internet based learning. Other researchers (Ahola-Sidaway and McKinnon, 1998) suggest that collaboration amongst educators and educational providers is another advantage, with joint development and delivery of educational content becoming more common. Hall (1995) expresses the opinion that it *"will multiply the capacity for students to review and master knowledge through self-paced, interactive study".*

Some researchers have focused on the ability of the Internet to create a global multi-cultural classroom. Bates (1996) asserts that *"new technologies offer the promise of a global classroom of students who can access teachers from anywhere in the world, and be able to participate in virtual classrooms with students from many nationalities and locations".*

According to Harding and Ziebarth (1995), *"anything on the web becomes material for shared real-time presentation and discussion in the classroom".* As more and more classes use the Internet, the information available from these classes has the potential to be reused by others.

The nature of courses will change, becoming more modular and *"personalised to match learner needs"* (Laurillard, 1994). According to Rajasingham (1996), learners will be able to select from universities that *"will provide smorgasbords of courses that are up to date and related to the new developments and new subjects".* This seems to reflect a change to a more market driven economy, with educational providers becoming more responsive to learner needs, a view shared by Cambell (1997), who asserts that *"the universities of the future who listen to their students will be able to adjust to a consumer driven global system of teaching and learning"*.

Using the Internet to deliver lifelong education has the potential to free learners from *"both the synchrony of time and of place that has characterised learning to date"* (Gomory, 1996). This freedom opens up the possibility of rich learning environments, that, according to Grabinger (1996, p.668) are *"much more comprehensive and holistic than individual computer applications"*. New technology has the potential to enable two-way dynamic interaction between learners and teachers, a marked change from the traditional distance education model that relied upon static interaction with material delivered using a one-way model of communication (Karaliotas, 1998).

The Information Technology Advisory Group (ITAG, 1996) indicated in their report to the New Zealand government that, in the near future, *"learners will switch between a virtual class and a real class"*. However, the implication is that the physical class will still exist, a view supported by Boettcher (1999) who suggests *"the shift from the classroom to the Web does not mean that the classroom goes away"*. Learners may end up learning in both real classrooms and virtual ones, a view supported by Tiffin and Rajasingham (1995).

One issue concerning technology-mediated learning is whether students can learn effectively within such an environment. Wilbur Schramm (1997, p.28) in a study of television versus classroom instruction reported the finding that there was *"no significant difference"* in student learning. However, many researchers are beginning to focus on what they perceive as the advantages of technology-mediated learning. For example, Laszlo and Castro (1995) reported that students become totally absorbed in task engagement when an interactive learning environment exists. They concluded that *"tools used in Web-based learning have the potential to move students onto higher order thinking where they would be the entrepreneurs of learning - creating new information as opposed to simply digesting and storing information for later use in life"*.

This is further supported by Hollenbeck (1998), who states that *"the Internet-driven curriculum is seen as a place for students to create meaningful knowledge on their own, using an environment full of experts waiting to be interviewed and vast amounts of information ready to be mined"*. These researchers suggest that the Internet environment may help with the construction of learner knowledge, either on their own, or with their peers.

In summary, some advantages of using the Internet for lifelong learning are:

- a greater range of teaching and learning activities are possible
- greater collaboration amongst learners and teachers
- cultural diversity
- personalised instruction
- any time, anywhere instruction
- higher level skills and cognitive thinking

Is this the whole picture? Some researchers are urging caution, and I will give examples of this in the next section. It is time to look at the other side of the argument.

## THE PROBLEMS OF LEARNING ON THE WEB

Many researchers are beginning to highlight potential problems with the use of the Internet for the delivery of education. For example, the Commonwealth of Australia (1995, p. 61) found that *"in remote locations indigenous peoples find it difficult to sustain the conditions necessary for independent study without specific support and a curriculum tailored to their needs"*. This seems to suggest that learning may be culturally based, and that tailoring of education into the context of culture may be a necessary ingredient for success.

One of the problems that Schegel (1996) points out is the size of Internet, asserting that the *"amount of information can become so sheer as to be overwhelming and perhaps, ultimately, discouraging"*. Other researchers such as Horn (1989, p. 220) recommend the breaking of information into smaller manageable quantities.

One area of current research is that on-line students may require different skills than their classroom counterparts. According to Hardy and Boaz (1997), *"prospective students need to* *know that a distance course requires self-discipline, self-motivation, the ability to work independently, and perseverance"*. Sanford and Richardson (1997) highlight the necessity for on-line students to develop adequate computer and Internet skills as a requirement for web-based learning.

Another issue appears to be the way courses are structured on the Internet. There has been a tendency to scan information from textbooks and make these available digitally, which, according to Micheal Hannafin (cited by Axelson & Hardy, 1996), means, *"we haven't accomplished much"*. This failure to effectively integrate technology into the learning process and simply use it as an add-on to existing curriculum is reported in research by Bailey, Ross and Griffin (1996).

The instructional design of on-line courses is an issue raised by Jane Conoley (1999). She asserts *"without the other two components [development of new pedagogies and technological application to existing and emerging learning theory], however, distance education will not take its place as a new teaching approach. It will remain only a delivery system"*. According to Sanford and Richardson (1997) a constructivist approach is necessary in web-based learning because *"students are forced to access, retrieve, reconstruct, adapt, and organise information in a way that is meaningful to their learning"*.

Roxanne Starr (1995) conducted research into the development of a virtual classroom. According to her findings, *"lecture type materials are boring. To maintain interest, the instructor should use written language in a skillful way, orchestrate active participation by the students, and stimulate collaborative assignments that involve both social and task-orienated activities"*. In addition, Starr raises the question of teacher-learner interaction and highlights the frustration experienced by learners due to the lack of an immediate response from the teacher. This issue of synchronous communications in the virtual classroom is mentioned by Sherry (1996), who asserts *"without connectivity, distance education degenerates into the old correspondence course model of independent study"*.

In summary, some disadvantages of using the Internet for lifelong learning are:

- learning is cultural dependent

- information must be presented as meaningful for the learner
- learners may suffer from information overload
- the skills required for on-line learners differ from conventional classroom learners
- instructional design of on-line courses is an important factor
- synchronous communication with teachers is necessary to maintain student motivation

I have looked at some of the issues associated with lifelong learning on the Internet. Now it is time to discuss some of the findings from my own project that has been involved in the delivery of self-learning courses via the Internet.

## OUR PROJECT: LIFELONG LEARNING ON THE WORLD WIDE WEB

In late 1994, I began looking at the use of sharing information from a centralised server. This information was mainly course notes, copies of assessments and reading material for students. Students could access this information from the computer labs as required. In effect, distance between my students and myself was reduced, the time element of accessing notes altered, thus creating our own little village.

In 1995, the files and documents were converted from Microsoft Write format to HTML and placed on the web server. We started with a module of the New Zealand National Certificate in Business Computing called Data Communications. The full set of notes, sample tests, previous examination papers and suggested answers were placed on-line. At that time our entire server was indexed nightly and integrated into an ARCHIE database.

Literally overnight we became known globally. Within a week more people outside the organisation accessed the material than those within it. Since then we have added more self-paced learning modules. Our site at CIT gets about a million hits a week from in excess of 25,000 visitors. We now have five major mirror sites worldwide (Belgium, Brazil, Finland, Canada, South Africa) and numerous others for individual modules. The material is used at 123 universities around the world, a number of organisations such as Sun, Microsoft, Nasa, US naval intelligence, Motorola and many others.

In June, 1999, the web site won the Global Bangemann trophy for the category "Lifelong learning" and I travelled to Stockholm, Sweden, to collect the trophy from the King of Sweden in the Nobel hall. Life-long learning, especially formatted as self-paced learning modules delivered via the Internet, is a popular and untapped market. We live in a world with a rapidly aging population. The skills required of workers are changing and the rapid rate of technological change causes workers to reinvest in training many times within their working career.

Self-directed learners want to be able to access information quickly and in a form that's easy to read. They want that information available at a time and place of their choosing and to be assured that the information is reliable and up-to-date. The self-directed learner is not the result of technological change. From birth we are all self-directed learners, adapting and reacting to the world in which we live. Somehow we seem to loose that ability when we enter the education system.

Life-long learning has become a reality for us all. Our educational institutions have been geared to present education to a small group of individuals for a limited time. They enter our doors, stay a year or two and then enter the work force. It is called tertiary education. But that is not the model of the real world. It is the model of the industrial world, one in which we have one foot in. It is a dying world. Our other foot is in the information world. And it is that world which is becoming the dominant one.

This new information world changes everything. We do not have the bricks and mortar to build new campuses. We have run out of physical building space and it is too costly to increase the number of students on campus. Our population is aging, and our major growth rate is not in school leavers, but in adult education.

Education is not just about buildings and it's not just about school leavers. The greatest market is the adult worker. Yet, mainstream educational organisations continue on with the industrial model of providing the wrong types of skills, using the wrong types of buildings, to the wrong types of students.

For example, we do not have to go to a movie theatre to watch a movie. We do not have to go to the news stand to get the latest news. We do not need a radio to listen to music. And we do not have to physically go to universities and polytechnics to learn. Just as the walkman revolutionised the delivery of music to people, so too the Internet can deliver education to people on the move, to when and where they want it.

Our lifelong learning site provides education at a time and location that suits the learner, 24 hours a day, seven days a week, 365 days a year. Its doors are never closed. People today are busier than ever. Many adult learners must retrain whilst on the job. Many employers won't pay for retraining. This availability satisfies a worldwide demand.

It is a microcosm of a model that we should all be using. For education is not about buildings and learning 8-5 Monday to Friday. Education is about infrastructures, transport systems and classrooms, where teachers, students, knowledge and problems meet. In this new information society, the transport systems are not buses, cars and trains, but networks and the Internet. The technologies are not chalk and books, but e-mail, video conferencing, list servers, chat rooms and the Web. At its core these new structures are technology based.

What are some of the lessons we have learnt from this global delivery of self-paced learning? That's a good question.

### LESSON 1: INTERACTION

Learning requires more than just reading. Interaction is a key ingredient of the learning process. To reinforce learning concepts, learners should apply what they have learnt. Traditional web sites implement this using interactive tests or assignments. Yet there are other ways to support interaction. The use of both asynchronous and synchronous mechanisms should be considered.

Asynchronous mechanisms are e-mail, list servers, and discussion lists. Answers are not immediate, thus learners can find these modes of interaction slow and frustrating. Synchronous mechanisms are real-time chat, video-conferencing and real-time tests. These provide immediate communication and responses, allowing learners to quickly progress through difficulties in their learning experience.

We consider that interaction is an essential component of on-line learning. Without this connection, many learners feel isolated and unable to progress further when problems in their learning are encountered. In our experience, provision of multiple communication mechanisms (both asynchronous and synchronous) is a necessity for effective on-line learning.

Interaction with teachers and learners helps to create a sense of cultural identity and belonging. Without interaction, it is too easy for the on-line learner to become discouraged and abandon their learning. In addition, the networking of learners' online facilitates new modes of communication. Dyadic as well as group communication amongst learners becomes increasingly possible in the on-line environment, especially when facilitated by the use of synchronous technologies.

## LESSON 2: FEEDBACK

Providing feedback is an essential element of learning on the Internet. When you develop online courses and share these with others, not only do you get the collective wisdom from other educators around the world, you also receive feedback from global users. This is essential for designing courses that are accessible globally.

Feedback from others may reveal many weaknesses that you might not have considered. Users will be able to identify errors and problems in your courses. Even companies like Microsoft are aware of the benefits of global testing with beta products. If the adage is true that two heads are better than one, then a thousand users on the Internet is worth a whole team of instructional designers. The development of material is thus an iterative process of refinement based on feedback from a global network of peers and learners.

Elements that have been identified for us by learners are the use of language, terminology, sequencing of material, navigational issues and accessibility. By accessibility I mean the ability of sight-impaired learners to read and comprehend the online material. Suggestions are incorporated into the next revisions of each module, leading to a cyclic process of revision and feedback.

## LESSON 3: LANGUAGE AND CULTURE

The language of the Internet is predominately English. As more and more global users connect, this poses a problem for the global delivery of education. Courses should be available in the native language of the learner. This is not just a translation of words, but of ideas and symbols. Semiotics is an important issue in global learning.

We have found the best way is to give the courses to others around the world free of charge. They then become responsible for the course translation. In effect they take ownership and customise the course for their own, and their student needs. We have had courses translated into Slovenian, Portuguese, French and Spanish.

## LESSON 4: COPYRIGHT AND OWNERSHIP

The issues of ownership and copyright coincided with the rise of the printing press and industrial age. However, the Internet makes possible the easy transfer and copying of information. This raises questions about what you can control and own in the digital world. Our solution was not to try to own it or protect it. Even though there are disclaimers and copyright statements on our work, these really are not an effective mechanism of control.

So we learnt to give information to others. Sometimes we are so protective of the information we have that we don't share it. That's because in our new information world, information is power. But if we are to empower others, we have to share what we have. And the benefit to the global community is obvious. Without this sharing, others cannot take the information and recode it culturally in their own language.

## LESSON 5: CO-OPERATION AND THROWAWAY DESIGN

Designing courses for the online environment is a huge investment for most organisations. Yet, there must be a balance between investment and change. Organisations should design for obsolescence. The investment should take into account that the average life of an on-line course is only a few years at best, before it is redesigned, rehashed and significantly altered.

This shift in paradigm from building courses to building links is an important one. There is much good stuff already out there on the Internet. We need to share more and co-operate more as educators. This means letting others use your material and connecting that material with others in new ways to generate new courses.

It is costly to develop material and continually refine it. Using the Internet, we can quickly construct a new course from existing material already available. Educators and providers around the world should cooperate more to make this information more readily available so that all learners from all countries can benefit.

## CONCLUSIONS

The lessons we have learnt from our own lifelong learning site are applicable to educational providers and educators alike. We suggest a new paradigm is necessary in the new millennium. This paradigm is based on co-operation, sharing and joint development of teaching material used in the online environment.

How do we proceed in the new millennium? Changes not only need to occur at the organisational level, but also at the teaching level. We proceed by encouraging educators to make their material more readily available and encourage others to work with them in translating it to other languages. This will be facilitated by free access and a willingness to share material. The benefits of this are better resources for learners. As a result, large repositories of courses will become available online for educators to access and reuse.

Communication amongst online educators and learners will be increasingly facilitated by synchronous communications. This will create new networks of interaction and facilitate new modes of learning by inquiry. E-mail, list servers, and discussion groups will complement synchronous forms of communication.

Online learners will increasingly have more input into what, how and when they learn. Educators will construct courses using fragments of those that already exist on the Internet. This montage of links will facilitate just-in-time course construction and allow educators to personalise learning for each student. The design of courses will change, with more emphasis being placed on instructional design for obsolescence.

If we are to embrace the paradigm of the Internet, we also need to abandon the paradigms of the industrial age. Our concepts of copyright and ownership must change to reflect the new environment in which we increasingly find ourselves immersed.

Once again, we repeat the comments of the South African Education Minister Sibusiso Bengu (1996) who stated in a white paper (15 March, 1995) on education:

> *"Our message is that education and training must change. It cannot be business as usual in our schools, colleges, technikons and universities."*

To embrace lifelong learning on the Internet requires us to abandon industrial age models and concepts of ownership, authority and delivery. We must begin to let learners control and direct their own learning experience. We must encompass that learning in a cultural environment that has relevance for them. And finally, we must cooperate more together as educators, exchanging material and lessons so that all citizens of the global world can benefit.

## REFERENCES

- Ahola-Sidaway, J., & McKinnon, M. (1998). *Ten principles that foster pedagogical soundness of multimedia learning materials.* Report submitted to Learning Materials Working Group, Department of Canadian Heritage, Ottawa, Canada.
- Axelson, Mary., & Hardy, L. (1996). *Learning on-line: As web-based curriculum grows, are textbooks obsolete*. Electronic School On-Line Journal. Retrieved 30 July, 1999 from the World Wide Web. http://Electronic-school.com/199906/0699f1.html
- Bailey, G., Ross, T., & Griffin, Sr., D. L. (1996). *Barriers to curriculum - technology integration in education.* Educational Considerations, 23(2). 14-17.
- Bates, A. (1996). *The information society: From potential to reality.* Retrieved 1October, 1999, from the World Wide Web. http://avc.uc.ie/ellis/abstracts/batesDrT.htm
- Bengu, S. (1996). Quoted in West, P. (1996). *Online Education in Southern Africa*. Paper presented at the Universities in the 21st Century Conference, Singapore, August 1996. Retrieved 7th August 1999 from the World Wide Web http://pgw.org/pw/21st-conf.html

- Boettcher, Judith. (1999). *Pedagogy and Learning Strategies.* Retrieved 30 July, 1999, from the World Wide Web. http://www.csus.edu/pedtech/Learning.html
- Bracewell, R., & Breuleux, A., & Laferrière, T., & Benoit, J., & Abdous, M. (1998). *The emerging contribution of online resources and tools to classroom learning and teaching.* Retrieved 7th August 1999 from the World Wide Web. http://www.tact.fse.ulaval.ca/ang/html/review98.html
- Bridwell, C., & Bretz, R., & DeVries, H., & White, B. (1996). *Instructional Design for Distance Education.* Communicators Handbook: Tools, techniques and technology (3rd Ed). Maupin House.
- Cambell, N. (1997). *Online learning for pre-service teachers.* Computers in New Zealand Schools. Vol 9. Pp21-24
- Commonwealth of Australia. (1995). National review of education for Aborginal and Torres Strait Islander peoples. Final Report, ACT. Canberra. Australian Government Printing Office.
- Conoley, Jane. (1999). Distance education: Special challenges to instructional excellence. Retrieved 7 August, 1999, from the World Wide Web. http://www.coe.tamu.edu/~distance/jconoley.html
- Dordick, H. 1987. *Information Technology and Economic Growth in New Zealand.* Wellington. Victoria University Press.
- Edwards, R. (1995). *Different discourse, discourses of differents: Globalisation, distance education and open learning.* Distance Education, Vol 16 (2).
- English, H., & Seath, I. (1998). *Lifelong Learning: The Essential Guide.* Somerset TEC and TQMI.
- Field, J. (1999). Opening address to the Association of University Administrators Annual Conference, March 29th 1999. Professor of Lifelong learning at the University of Warwick. Retrieved 7 August, 1999, from the World Wide Web. http://www.csv.warwick.ac.uk/news/pr/education/132
- Gomory, R. (1996). *Learning outside the classroom - The time is now.* Keynote address delivered at the Second International Asynchronous Learning Network Conference. Retrieved 7 August, 1999, from the World Wide Web. http://jrbnt.vuse.vanderbilt.edu/alncnf96/keynote.htm

- Gore, A. (1997). Address to the CAEL Joint National Conference. Retrieved 1st October 1999 from the World Wide Web. http://www.cael.org/confwork/algore.html
- Grabinger, R. S. (1996). Rich environments for active learning. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 665-692). New York: Macmillan.
- Hall, J. (1995). *The Revolution in Electronic Technology And The Modern University.* Educom Review. Vol 30. No 4. Retrieved 18th August 1999 from the World Wide Web. http://www.educause.edu/pub/er/review/reviewarticles/30442.html
- Harding, J., & Ziebarth, J. (1995). *Digital technology and the impact on education.* Retrieved 1 October, 1999, from the World Wide Web. http://inet.edu.gov/~gsolomon/hardin.html
- Hardy, D., & Boaz, M. (1997). *Learner Development: Beyond the Technology.* New Directions for Teaching and Learning, #71, Jossey-Bass Publications.
- Harris, J. (1998). *Virtual architecture: Designing and directing curriculum-based telecomputing.* Eugene, OR: ISTE Publications.
- Hollenbeck, J. (1998). Democracy and computer conferencing. *Theory into Practice, 37* (1), 38-45.
- Horn, R. (1989). *Mapping Hypertext: The analysis, organisation and display of knowledge for the next generation of on-line text and graphics.* Lexington MA. Lexington Institute.
- Information Technology Advisory Group. (1998). *Impact 2001. How IT will change New Zealand.* Retrieved 10th August 1999 from the World Wide Web. http://www.moc.govt.nz/pbt/infotech/impact/impact.html
- Karaliotas, Y. (1998). *Interactivity in the Learning Environment: Distance Education.* Retrieved August 9th 1999 from the World Wide Web. http://users.otenet.gr/~kar1125/iaction.htm
- Laszlo, A., & Castro, K. (1995). *Technology and values: Interactive learning environments for future generations.* Educational Technology, 35(2). 7-12.
- Laurillard, D. (1994). *Rethinking University Teaching: A framework for the effective use of education technology.* NY. Routledge.
- Rajasingham, L. (1996). *In search of the virtual class: Education in an information society.* Paper presented at Life-Long learning for the information society conference, Genoa, Italy, 24-28 March, 1996.

- Resnick, M. (1996). *Distributed Constructionism* - Proceedings of the International Conference on the Learning Sciences Association for the Advancement of Computing in Education, Northwestern University, July 1996. Retrieved 1st October 1999 from the World Wide Web. http://el.www.media.mit.edu/groups/el/Papers/mres/Distrib-Construc/Distrib-Construc.html
- Sanford, S., & Richardson, K. (1997). *Interactive Instructional Design: Old Paradigms for New Technologies.* Retrieved 30 July, 1999, from the World Wide Web http://star.ucc.nau.edu/~nauweb97/papers/sanford.html
- Schegel, K. (1996). *Why the Web?* Retrieved 30th July 1999 from the World Wide Web. http://Netspot.city.unisa.edu.au/netspot/eduweb/Theory/WhyWeb/~whyweb.htm
- Schramm, W. (1997). *Big Media, Little Media: Tools and technologies for instruction.* Beverly Hills, CA. Sage.
- Sherry, L. (1996). *Issues in distance learning.* International journal of educational telecommunications, Vol 1, No4. 337-365
- Starr, Roxanne. (1994). *The Virtual Classroom: Learning Without Limits via Computer Networks*. Norwood, New Jersey. Ablex Publishing Corporation.
- Thorvaldsen, P. (1980). (Ed). *From books to bytes: The impact of technology on education*. Toronto, Canada. TV Ontario.
- Tiffin, J., & Rajasingham, L. (1995). *In search of the virtual class: Education in an information society*. London. Routledge.

TEND 2000

Crossroads of the New Millennium

# Responding To The Challenges Of Internet Technologies And New Media: Issues For Polytechnics And Institutes Of Technology

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Workshop 1

# Abstract

The rapid and widespread changes that have occurred in most aspects of tertiary education in New Zealand have posed challenges for both educators and administrators at polytechnics and institutes of technology. There are similar trends occurring in other countries. Growth opportunities, alliances and mergers, and strategies for remaining financially viable, are topics as often discussed now in educational institutions as those relating to pedagogical and course design issues.

The ongoing, rapid development in information technology and its potential for supporting existing and new forms of course delivery is a very topical issue and one that probably presents the greatest current challenge for staff. Every polytechnic and institute of technology in New Zealand is making some use of new information technology and Internet-related concepts such as e-mail, discussion list servers, browsers, web pages, chat, intranets and associated new media forms are now recognised throughout the sector.

However, observation indicates that developments incorporating effective use of the new technology and media to support course delivery are still somewhat uneven. In addition, at management level some institutions may not be viewing such use of technology as important in a strategic sense, or have a visible plan for managing its long-term development.

This paper examines the communication design issues faced by educators who choose or are required to use course delivery mechanisms mediated by new technology, in particular Internet-related information technology. It suggests a number of approaches to help educators come to terms with the challenges of using new media forms effectively, and for institutions to consider as part of strategic planning processes.

# Responding to the Challenges of Internet Technologies and New Media: Issues for Polytechnics and Institutes of Technology

## INTRODUCTION

If we accept that great potential exists to transform teaching and learning with new technology, and sufficient evidence now exists to satisfy the convicted positivist, the radical constructivist and just about everyone in between, the question remains as to why more visible progress has not been made some 40 years after the 'revolution' began? (Gunn, 1998, p.134).

So what progress has actually been made? Every polytechnic and institute of technology in New Zealand is making some use of new information technology and Internet-related concepts such as e-mail, discussion list servers, browsers, web pages, chat, intranets and associated new media forms are now recognised throughout the sector. However observation indicates that current developments incorporating effective use of new information technology and media to support course delivery and provide learning opportunities are still somewhat uneven. In addition, at management level some institutions may still not view such use of new technology as crucial in a strategic sense, or have a visible plan to manage its long-term development.

Over the past decade, many radical changes to the education system were implemented in New Zealand. Tertiary institutions struggled with decreased direct government funding, the two-edged sword of autonomy/accountability and increased demands from "clients" for both more flexibility and better quality. Growth opportunities, alliances and mergers, and strategies for remaining financially viable became topics as often discussed in institutions as those relating to pedagogical and course design issues.

In the midst of these changes to institutional structure and the formation of new alliances, new information technology, with its perceived potential to help institutions meet set objectives, appeared to provide some real opportunities. Administrators perceived new technology developments, particularly those associated with the Internet, as providing opportunities to cut course delivery costs and increase revenue, while educators recognised the promise of various new information technologies and media forms to enhance and expand learning opportunities and improve the quality of education programmes. Tiffin and Rajasingham (1995) described a new technology-facilitated education model which created fundamental change in the way educative processes were managed, and predicted a number of subsequent benefits.

In reality, the continuing flood of information about what new technology is available and where and how best to implement it, created sensory overload for administrators and academic staff alike. Blacker (1988, cited in Hearn, Mandeville and Anthony, 1998) argued that the key issues for information technology implementation would no longer be technological efficiency but understanding and working with the power structures that governed its use, its integration into day-to-day management and communication processes, and beyond mere integration, the changing of the fundamental nature of these processes. It can also be argued that support for the introduction of new information technology as a cost-effective strategy without attention to critical design factors for successful implementation and use in an educational context, provides no long-term benefits to institutions.

The current environment in New Zealand has been one in which tertiary education, although encouraged, has been primarily viewed as a "private" good, an economic indicator, and the responsibility of individuals. In this deregulated model, institutions were expected to compete and make a profit. This approach now appears likely to undergo at least some modification due to the recent change of government, although complete details are not known yet. However, it is clear that the new government is interested in changing the way in which the tertiary education sector operates and the way in which institutions relate to each other, and that it wishes to see the development of a much more co-operative and cohesive model.

This paper examines some of the promises of new Internet-related technologies and attempts to suggest some ways for polytechnic educators to come to terms with the challenges of using these new technologies and media forms, within a more co-operative and collaborative environment.

## PROMISES AND PROBLEMS OF THE NEW MEDIA

The very nature of the new technology provides both promises and problems. Strangelove (1994) described the Internet as a "distributed and open systems technology. *Distributed* meaning that it has no central location and *open* referring to the fact that the operating codes are not proprietary or secret. Everyone can contribute to the design and development of the overall system." (p.7).

Tapscott (1998) argued that there has been a fundamental shift occurring in technology from relationships based on force to relationships based on open acceptance. The concept of education changes in the move from the paradigm of teacher as transmitter of information to students learning through discovery and new media. The teacher's role is still critical, but changing - to structure the learning experience, motivate, provide context, and integrate disciplines. "N-Geners who are used to interactive learning will be increasingly unsatisfied with the old model. As they enter the workforce as teachers and policy makers, they will bring the new paradigm of interactive learning with them." (p.290).

In similar vein Spender commented:

> In the electronic world, we don't have knowers: we have *users*. The transition has been going on for the past few decades: the role of the teacher as authority figure and knower has been in decline as the amount of available information expands. As most teachers are print-reared, and as only a relative few have made the shift to the new media which is now the business of the world, the gap between what teachers know and what is electronically produced is forever widening. (1995, p.102)

The primary challenge for the polytechnic tutor/lecturer has always been to create effective learning environments that support student learning and facilitate learning experiences appropriate to some specific set of objectives. This has always been part of the work of teachers. Many polytechnic educators originally came from industry, trade or professional careers, rather than from academic backgrounds, although this is changing as the range of courses widens to include degrees. Most have received some training in how to teach, but this has often emphasised vocational training techniques and practical applications of these within specialist areas, rather than theories of learning and teaching or instructional design models and techniques.

The most difficult part of creating effective learning opportunities is in the design of courses and the learning environment - it is here that media are chosen and implementation planned, in order to meet relevant objectives. It appears that initial changes in course design and delivery involving the use of new information technologies and media forms have most often been introduced by enthusiastic staff members acting on an individual basis, or within groups operating at the teaching level, using their own time, and bringing skills and knowledge acquired from elsewhere, often self-taught. This mode of development can have critical implications for consistency and quality control.

Three stages in the use of Internet-related technologies can be identified, although these are not discrete stages, and may not represent linear development. There is also an overlap between the way the technology may be used in the course design and course delivery processes. The first stage involves the use of e-mail: messages between colleagues, communication swapping and sharing of information, discussion lists, tutor/student communication, student/student communication. The new medium has different characteristics to other forms of communication: it is fast, asynchronous, anywhere/anytime and informal. Users appear to learn to communicate in the medium by using it, as there may be little or no formal instruction in its use or protocols.

Bridgeman, Stewart and Bridgeman (1995) described a successful pilot project to teach the Advanced Certificate in Business Computing to students in Taumaranui using distance education techniques, from the Taranaki Polytechnic main campus in New Plymouth. The main medium of communication used was e-mail, as this was a proven technology, would be cheap to implement, and required minimal training of staff and students. Phase Two of the project identified plans to establish an e-mail listserver, and add audio/graphical/video links.

The project report concluded:

> It appears very likely that in the not too distant future we will see a change in the present format of existing Business Computing Tutor jobs, brought about by decreasing government funding. Possible new ways of course delivery using the new technologies will require that innovative strategies be adopted if tutors are to survive in the new environment. (Bridgeman et al, 1995, p.13)

The second stage involves the use of browsers: web-based material, home pages, chat and so on. This stage most reflects current polytechnic use of Internet-related technology, and provides the greatest challenge for educators at present. Many individual tutors, who have acquired some knowledge and skills in the new technologies, are attempting to translate existing course material into new media forms. Much of this work shows interest and desire to incorporate new forms of media, but some critical issues emerge: for example, dumping existing print-based material straight into web page format is not the best use of the medium, and as yet there appears to be a shortage of appropriate design skills.

Brennan (1998) identified the process followed by one tutor, and how difficulties were faced and resolved. The biggest problem appears to be the lack of adequate development time to fully appreciate the demands and requirements of the new media and learn how to design for it, underpinned by uncomfortable feelings of many tutors that their young students have a much better grasp on the technology than they do. As Spender commented "Young people are *doing* information and learning. They want to have information literally at their fingertips, and to be able to work it, move it around, play with it, rather than keep it in their heads and deliver it on cue." (1995, p. 108).

It is at this stage that great misunderstandings can occur between administrators who glimpse the potential of new forms of delivery, and the tutor who must develop and deliver the promise. Chamberlain (1997) examined opportunities in telelearning in a mythical polytechnic, and identified a range of expert skills and knowledge that would be required for effective development. Albertson and Selwood (1997) identified professional development for teachers as a crucial requirement in order to "maximise the opportunities that technology dreams foretell." Tiffin commented "The freedom that information technology can confer on the student of the future must also be conferred to the teachers of the future. (1991, p.7).

The third stage of Internet-related technology use involves applications of virtual reality, hyperreality, artificial intelligence and so on, and provides both the biggest promise for education innovation but also the biggest challenge for incorporation in course design and delivery. These applications are only at the beginnings of their development, and have huge cost implications both in time and money. They involve high interactivity mechanisms, and require high levels of collaboration between users and developers. Conley (1998) discussed the globalisation of education, and described the development of collaborative, interactive environments supported by use of new media. Again, the crucial issue of adequate training for tutors is identified:

> The difficulty of this objective is not in its technical feasibility but in the education of educators in how to design, prepare, and utilise such non-linear forms of material. It is in the technology of creating materials and aiding educators and students to create and utilise non-linear materials that the true pragmatic challenge lies. (Turoff. 1995, cited in Conley, 1995, p.27)

Issues identified earlier also impact on the promise of the new technology and the potential for this to be realised: the competition for resources within institutions, the struggle for control between technologists and educationalists, and the limited appreciation of the strategic importance of new technology. Alessi (1997) asserted that many educators now focus directly on the use of electronic technology for instruction instead of examining what people now need to know and learn, and where this learning might take place, and then reframing this within appropriate technology.

Dr John Hinchcliff, President of Auckland Institute of Technology (now Auckland University of Technology), in a recent address to New Zealand polytechnics' chief executives, argued:

> It is not so difficult to put programmes directly on to the Internet and other computer-based technologies. It is a different proposition to make use of the full capacity of these technologies for significantly changing the way learning is organised and delivered. This process is expensive, requires significant structural development and organisational change … (1999, p.3).

Gaining clear and objective information about relevant new technologies and their capability to provide support for education delivery can be difficult and time consuming. Commercial companies continually receive advice and information about the newest technologies and methodologies from vendors, although by contrast, many vendors have less interest in the education market because it appears to have relatively limited spending power. "…teachers have mostly missed out on the promise (and the reality) of digital media, because the tools are too expensive and there's no quantifiable 'return on investment' to justify them." (Dyson, 1998, p.106). However, these attitudes are changing as education is seen increasing as a business and a marketplace, and many hardware and software companies are now developing arrangements with education providers that range from sponsorship to business partnerships. Microsoft, IBM, Computer Associates, Aoraki Corporation and Rational Software are among organisations that have offered special product pricing arrangements to NZ polytechnics.

## Critical Design Issues

Negroponte argued "The big changes in computers and telecommunications now emanate from the applications, from basic human needs rather than from basic material sciences." (1995, p.76). There are some critical communication design issues to be faced and resolved in ensuring we design for education rather than designing for technology. The following issues are identified for discussion:

- Determination of the educational objectives first, then consideration of appropriate technology, not other way around.
- Development of flexible, interactive, collaborative and supportive environments.
- Cybernetic aspects - importance of considering feedback and incorporating changes.

- Time required to learn, reflect and integrate an awareness of the new media. This is a particularly important design issue, and two points offered for consideration by Hearn, Mandeville and Anthony are relevant here. ".. while the highway may represent an evolutionary leap in communications hardware and software, the psychological capacities of individual users have not similarly evolved. ... the issue of individual identity in virtual societies is particularly relevant." (1998, p.37).
- Human interface design aspects.
- Dynamic aspect to systems.
- Aspects of chaos - underlying patterns to be discovered.
- Virtual environments.
- Responsiveness to individual needs/choices.
- Transparent technology - enabling, unobtrusive. Range includes multimedia, Internet, Intranet, MUDs, MOOs, videoconferencing, videos, CD-ROMs, interactive software, PDAs, smart cellphones, wireless telecommunications, wireless LANs.
- Continuing technology convergence
- Evaluation: academic standards, credibility
- Portability of qualifications
- Range available of study options/delivery modes/physical locations/times: "anywhere, anytime, lifelong learning."
- Rules, regulations, protocols (including documentation management and controls on access to material).
- Ownership and intellectual property issues.
- Support for applied research to inform and improve practice.

## SO HOW CAN WE LEARN? WHERE AND HOW TO START?

> In an electronic era, an education system, which is based on what people keep in their heads, is doomed. If there is one thing that computers have taught us, it is that heads are not good places for keeping information in. In comparison to electronic retrieval systems, heads are poor retrieval systems. (Spender, 1995, p.105)

The best answers may lie in the technology itself: much of what we need to know can be found with the help of the very technologies we need to learn about. In experiencing how others are using the media to communicate, and in teaching ourselves and colleagues, we will teach what we most need to learn. There are numerous excellent resources that can be accessed online that both demonstrate and teach design skills. A number of designers recognised internationally are accessible online. Jacob Nielsen's *Alertbox* pages are informative, easy to read and access, and are grounded in ongoing research. Other designers such as Bruce Tognazzini, Keith Instone and Rachel McAlpine offer comparable insights. The connecting links to others carrying out similar work in many different countries are endless.

A mentor/buddy/apprentice system could provide an effective and supportive model. At present, educators often work alone and do not show their material to others unless there is some institutional requirement to do so. Gunn (1998) makes the point that consultation and collaboration between colleagues become crucial in a field that is advancing as rapidly as education technology, where the speed of developments usually means it is not possible for one person to keep up with the state of play in all aspects.

Open, interactive systems, incorporating automatic peer review, including students as part of the evaluation, providing loops for immediate feedback: these cybernetic mechanisms create environments that reflect chaos theory and fractal effects. The underlying patterns emerge as prototyping begins to produce something dynamic that works. Brown (1997, 1999) presented a working model for the delivery of course material that focused on the basic needs and wants of users and incorporated genuine feedback mechanisms, enabling continued change and improvement. Verhaart (1998) described successful results using a similar model of development for designing and building such prototypes. Referring to concepts first developed by Tiffin and Rajasingham (1995), Chamberlain (1998) outlined a systems approach, using as a model the education system as a communication system.

## SOME ACTIONS FOR CONSIDERATION

And where will educators find time for this learning and creative development? In these times of tight staffing ratios and decreasing funding, time for design and development work may be difficult to achieve, however some time may be gained through flexibility in class sizes and delivery modes. Theoretical material can be delivered in lecture format to large groups, with smaller sized practical workshops following. Self directed, self paced learning material can be delivered in a number of ways, for example printed workbooks, CD-ROMs, and online. Audio/video recordings of lectures and other sessions can form part of this material.

As identified earlier, people need training in developing and presenting material in new ways. For many institutions, the allocation of adequate time and funding to support professional development and training in new areas, particularly development of skills in instructional design, is a critical issue. In support of this Hinchcliff (1999) argued: "Staff development is an absolute requirement. A systematic and sustained programme of staff development will have to be organised to ensure colleagues understand the conceptual factors requiring changes in our educational delivery." (p.8).

Spender commented 'Helping teachers to cease teaching what they were taught - that's the revolution.' (1995, p.116). However, helping teachers to cease teaching *how* they were taught may be the more crucial point. Under stress, teachers fall back on the ways they were taught. "..new media don't always change the old mindsets." (Spender, 1995, p.118).

A number of possible courses for action emerge from consideration of the design issues and current research in this area. Note that it is not merely a question of thinking and planning. Educators will learn best by experiencing and working with these new media, and in recovering from mistakes. Feedback is the critical component. The aim is self-directed, self-corrected, self-improved, life long learning patterns of thinking. The following suggestions are for consideration by both managers and educators:

- Recognise the overall strategic importance of new technology developments to the institution and plan accordingly. Include relevant objectives in strategic and business plans. Allocate adequate budget. Develop infrastructure to provide appropriate support.
- Analyse staff needs and arrange access to required training and resources. Those more aligned to the use of print media will need time to move into the new design paradigm. The aim is to help staff acquire relevant design skills together with a better appreciation of new media capabilities. Recognise the relevance and importance to the institution of the concept of "life long learning," and allow for this continuing requirement in professional development expectations for staff.
- Employ a co-operative and collaborative approach: form user groups, and share, learn, talk and work together; avoid re-inventing the wheel; build effective links to other institutions rather than repeating information everywhere; use the technology itself to create ways to use it more effectively.
- Choose technologies appropriately, giving more weight to those with interfaces that have human-like features, and use them in ways that can become more transparent and less intrusive. If the new technology is too dominant, too important, too intrusive, and not

subject to the end-user's real needs, there is a danger that essential communication will be lost in the noise and distortion created by the new technology's processes.

- Use a prototyping approach and the interactive, cybernetic quality embedded at the heart of Internet technologies to both build effective learning environments and maintain them.
- Closely involve students in the development of their own education. Increasingly the line between teacher and student is blurred. Students must be involved in creating their own learning experiences, but also can contribute as young designers using media with which they are already familiar.

## CONCLUSION

> Many young people already operate in the new medium. (They have not had to make a transition: it's the way their world works.) They understand that information is freeflowing (in the ether) and that the issue is to access it. (Spender, 1995, p.106)

This paper examined some of the issues relating to new information technologies and new media. A question was posed: "Why does progress in adopting new information technology to support teaching and learning activities still appear to be relatively slow and uneven when the promise has been evident for some time?" For many educators, even those very motivated and interested in using new media for course delivery, the pace of development appears to have been too fast and the learning curve required to become an expert user too steep for comfort.

In similar fashion to the difficulties experienced by many in learning a new language later on in life, people whose first learning and teaching experiences focused strongly on print-based media may struggle to use new media forms. Their paradigm is translation, translating their understanding of educational concepts and their existing material into the new media forms, rather than having the ability to think, imagine and design directly within the new forms. For others, the main difficulty has been the unavailability of any allocated development time in which to learn these new skills and create new material.

It is clear that the continuing development and refinement of new information technology, particularly Internet-related, will provide ongoing opportunities and challenges for polytechnic educators in the design and delivery of courses. The often quoted statement, attributed to Microsoft's Chairman Bill Gates, that we overestimate what new technology developments will happen in the next two years, and underestimate what will happen in the next five, appears to present a reasonably accurate picture of what is currently occurring in New Zealand as well as other countries.

In order to be able to work effectively with new media that will continue to be developed, educators will need time to integrate these new ways of knowing into their consciousness and feel comfortable using them. The use of new media forms must incorporate interactivity and cybernetic mechanisms from the beginning, and all feedback should be given serious consideration.

This new paradigm of development allows all parties to be involved, and significantly blurs the roles of teachers and learners. Allowing time for reflective thought and integration is critical, together with support from collegial mentors who are going through similar processes. The development of real and virtual environments that support collaborative work, research and learning will be crucial. Institutions must recognise the strategic importance of new technology developments in the support of innovative education delivery and budget accordingly. As Hinchliff argued, adequate professional development is an absolute requirement for staff to move successfully into new development models, able to make effective use of the new technologies and media and to resolve relevant instructional design issues.

So it all takes time and resources, much more than was first thought would be required. It seems that issues relating to effective use of Internet-related technologies and new media for supporting education delivery still pose some problems for tertiary institutions. Failure to face these issues may lead to institutions losing credibility as providers of up-to-date and relevant education and at worst, may seriously threaten their viability. The critical challenges for polytechnics and institutions of technology in New Zealand are to recognise the importance of these issues and develop appropriate strategies for their resolution.

## REFERENCES

- Albertson, T., and Selwood, S. (1997). Tools to Toys: A Continuum Created out of Constancy amid Change. *NZ Journal of Applied Computing and Information Technology*, 1:1, pp.1-9.

- Alessi, S.M. (1997). Learning in the 21st Century: What, Where and How? *NZ Journal of Applied Computing and Information Technology*, 1:1, pp.10-16.
- Brennan, T. (1998). Computer Mediated Course Delivery. *NZ Journal of Applied Computing and Information Technology*, 2:1, pp.1-7.
- Bridgeman, L., Stewart, T., and Bridgeman, N. (1995) Electronic Information Distribution: Teaching at a Distance. *Proceedings of the National Advisory Committee on Computing Qualifications Conference*, Wanganui, 5-7 July.
- Brown, B. (1997). Designing WWW Courseware for the Masses. *Proceedings of the National Advisory Committee on Computing Qualifications Conference*, Nelson, July. [Online] Available: http://www.cit.ac.nz/staff/brownbr/naccq97.htm
- Brown, B. (1999). Making a Difference Through Global Thinking. *Proceedings of the Association of Polytechnics in New Zealand (APNZ) Conference*, October. [Online] Available: http://www.apnz.ac.nz/Conferences/1999/brian_brown00.htm
- Chamberlain, B. (1998). Beyond the Boundaries of the Classroom and on the "Net": Identifying the Critical Success Factors. *NZ Journal of Applied Computing and Information Technology*, 2:2, pp.16-26.
- Chamberlain, B. (1997). Telelearning at Aotearoa Polytechnic: A Possible Scenario. *NZ Journal of Applied Computing and Information Technology*, 1:1, pp.36-48.
- Conley, N. (1998). Delivery of a Qualification in a Global Marketplace: Aspects for Consideration. *NZ Journal of Applied Computing and Information Technology*, 2:1, pp.19-29.
- Dyson, E. (1998) *Release 2.1.* London: Penguin Books
- Gunn, C. (1998). Virtual Technologies in Higher Education, in M. Peters and P. Roberts (Eds.) (1998) *Virtual Technologies and Tertiary Education.* Palmerston North: The Dunmore Press
- Hearn, G., Mandeville, T., and Anthony, D. (1998). *The Communication Superhighway.* Sydney: Allen & Unwin.
- Hinchcliff, J. (1999). Making a Difference Through Using the Internet. *Proceedings of the Association of Polytechnics in New Zealand (APNZ) Conference*, October. [Online] Available: http://www.apnz.ac.nz/Conferences/1999/john_hinchcliff00.htm
- Instone, K. *Usability Heuristics for the Web.* [Online] Available: http://webreview.com/wr/pub/97/10/10/usability/sidebar.html
- McAlpine, R. (1999). *Web Word Wizardry.* Wellington: Corporate Communications. [Online] Available: http://www.globalenglish.co.nz

- Nielsen, J. (1994). Heuristic evaluation. In J Nielsen and R Mack (Eds.) *Usability Inspection Methods.* New York: John Wiley and Sons.
- Nielsen, J. (1997). How Users Read on the Web. *Alertbox*, 1 October. [Online] Available: http://www.useit.com/alertbox/9710a.html
- Spender, D. (1995). *Nattering on the Net*. Melbourne: Spinifex Press Pty Ltd
- Strangelove. M. (1994). The Internet as catalyst for a paradigm shift. *Computer-Mediated Communication Magazine, 1,*8, December. [Online] Available: http://www.strangelove.com/writings/catalyst.html
- Tapscott, D. (1998). *Growing Up Digital*. New York: McGraw-Hill.
- Tiffin, J. (1991). Intelligent Schools. Keynote speech at New Zealand Computers in Education Society (NZCES) Conference *Kids, Classrooms and Computers*, 1-4 September, Wellington, pp.1-7.
- Tiffin, J., and Rajasingham, L. (1995). *In Search of the Virtual Class: Education in an Information Society.* London: Routledge.
- Tognazzini, B. *Principles of Design.* [Online] Available: http://asktog.com
- Verhaart, M. (1998). Prototyping a Variety of Delivery Methods Using Internet Technologies on a File Server. *NZ Journal of Applied Computing and Information Technology*, 2:1, pp.103-111.

## APPENDIX

### Presentation of Paper at Interactive Workshop

The presentation of this paper at TEND 2000 formed part of an interactive workshop. As the paper's main points were summarised, workshop participants identified and discussed key issues and concerns relating to the use of Internet-related technologies and new media. Some information about the experience of New Zealand polytechnics and institutes of technology in this area was included.

At the end of the workshop, participants completed a brief survey on existing levels of knowledge and use of these technologies in their own institutions, and identified possible barriers to the effective development and use of these technologies to support education delivery. This survey was also made available to other conference attendees after the workshop.

### Issues and Concerns Identified by Participants

- Ongoing staff development

- Intellectual property and copyright issues
- People or technology – which first?
- Fear of technology/fear of job loss
- Slowness of existing technical infrastructure
- Teachers' ability to keep ahead of their students
- How people learn best in a web-based environment
- Development of effective online learning environments
- Effective online delivery of technical/practical subjects
- Online student support models
- Role of independent learning centres
- Information literacy
- Education and training for technicians or technologists?
- Accreditation issues
- Development and maintenance of standards

## The New Zealand Experience

A brief examination of the online presence of New Zealand polytechnics and institutes of technology was completed prior to the TEND conference. This indicated that all 24 institutions have websites, although these vary in content and complexity. When questioned, ten (42%) indicated they had a functional intranet or that this was either under development or consideration. Nine (38%) indicated they were offering online courses. The experience of one institution, Whitireia Community Polytechnic, in establishing a strategic focus for development jn this area, was described.

## Possible Barriers to Development Identified

- Lack of knowledge and skills
- Gaps in technical infrastructure
- Lack of relevant software resources
- Limited technical support
- Little or no recognition of strategic issues
- Limited funding available
- Lack of access to relevant training
- Limited development time allocated
- Resistance to change

**Survey Results**

Initial analysis of the survey questionnaire indicated the following:

- Internet access appeared to be widely available for staff and students.
- Intranets were reported as under development by the majority of respondents.
- Strategic planning by institutions for the use of information technology appeared to be variable.
- There was a wide range in the levels of understanding and use reported of various technologies and media.
- The barriers to effective development identified as the four most important were:
    - Limited development time allocated
    - Limited funding available
    - Lack of knowledge and skills
    - Lack of access to relevant training

## CONCLUSION

The original issues raised in this paper were reflected closely in similar issues and concerns raised and discussed by participants at the workshop. It appeared that educational institutions shared many issues in common and would benefit from consideration of the strategies suggested in the paper for consideration:

- Recognise the overall strategic importance of new technology developments to the institution and plan accordingly.
- Analyse staff needs and arrange access to required training and resources.
- Employ a co-operative and collaborative approach.
- Choose technologies appropriately.
- Use a prototyping approach with effective feedback mechanisms.
- Closely involve students in the development of their own education.

Workshop participants were thanked for their active involvement, their willingness to share experiences and their openness in identifying real issues and concerns.

TEND 2000

# Crossroads of the New Millennium

## Working Knowledge

Prepared and Presented

By

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Workshop 2

# Abstract

**Working knowledge** is the kind required almost everywhere: universities, whether corporate, virtual, technological or traditional, are all caught up in, and being re-defined by, new epistemologies, mediated by markets. Beyond universities, organisations as worksites-of-learning are exploring knowledge creation and workers everywhere are trawling their experiences for that creative edge. With 'lifelong learning' as the policy mantra, enterprising nation states are provoking consideration of 'working knowledge' almost everywhere. Thus, the time is right for a vivid re-conceptualisation of general/liberal learning, and current research can show what this would be like. Drawing on some international publications in education, I will outline this new 'working knowledge', building up that re-conceptualisation, and explicitly linking it to policy developments and to constructive workplace practices.

# Working Knowledge

## LEARNING: AT THE CROSSROADS? OR A 'A BRIDGE TO THE FUTURE'?

Whichever metaphor you prefer - the crossroads, or the bridge - it is clear that lifelong learning has re-appeared from its 1970s incarnation as global and globalisable justification for all manner of reforms to educational programmes, so that adults (and potential adults - those still school children) can create fulfilling lives. Lifelong learning as national policy, at least in Western democracies, assumes that it is up to each adult to identify and pursue opportunities for her or his own employability, and that this may include formal studies (the old 'recurrent' or continuing education ethos), and also informal experiences. UNESCO, at its Second International Congress on Technical and Vocational Education, in Seoul in April, 1999, had as its theme, *Lifelong Learning and Training: A Bridge to the Future*. Crossing that bridge to the future, according to UNESCO (1999), will mean:

> …lifelong learning opportunities. Some proposals to facilitate this approach include designing courses in modular format, introducing competency-based assessment, using self-paced learning to meet individual requirements, and giving recognition to the experience, knowledge and skills already possessed… (para 14)
>
> The future of lifelong learning is thus, at least in policy terms, bound up with what it is to be a whole person, because 'experience, knowledge and skills already possessed' range over all of a person's life, not just that part of it in paid employment.

There are many aspects to 'lifelong learning', such as the construction and distribution of the very selfhood of a person (*Futures* 31:8 passim), the role of educational institutions in capturing informal experiences, especially via the new virtual technology (*Futures* 30: 7 passim), and in the juggling required between family and work-based responsibilities as 'contingent' or just-in-time employment takes hold (*Futurework* 1999 passim). I want in this workshop to raise these sorts of issues, but mainly through presenting some brief research evidence of the workplace as a site of adults' informal experiences, especially on our emotional involvement in practical workplace judgments.

## THE WHOLE PERSON AT WORK

A prominent futurist, James Bellini, is making much of the emotions. By the year 2025, Bellini expects corporations to have fixed assets (plant etc) one-tenth the size they are today, but a much more prominent role for the 'emotional economy', where abstractions such as company likeability, brand loyalty and relationships are nurtured. (Bellini 1999)

The contextually-sensitive nurturing of relationships, workplace by workplace, is worth exploring, then, because the learning, which is thought to arise, may affect and have been affected by, life experiences in general. If Bellini is right, this may in turn have a market edge. Vocationalised lifelong learning can be investigated for its expectations of the 'whole person' at work. Work experiences are, however, highly contextualised. It is my office, factory and lunchroom which fires me up and cools me down on a daily basis. Each worker relates first and foremost to her or his immediate work setting, and expects the wholeness of her/his personhood to be manifest in the sociality and ephemerality (or 'hot action': Beckett, 1996) of that setting.

Many philosophers, of whom Aristotle is one splendid example, similarly recognise the situation or context of human activities as crucial to the meaningfulness of those activities. Our very selfhoods are, perhaps, constructed first by each other (that is, socially and emotionally), from which our individuality then flows. Workplace learning takes this sequence seriously (see *Educational Philosophy and Theory* 1999: 31: 3). From this new interest in practical judgments, there are inferences towards a new 'paradigm' of knowledge for the next century, which I can only briefly allude to here (Beare and Slaughter, 1993: 70; Hager and Beckett, 1998).

I argue that if we are serious about whole-person workplace learning, we must confront reductive and narrowly cognitive 'paradigms' (as Beare and Slaughter put it). It seems to me that workplace learning will be more apparent in those who understand their own 'context' or situation in daily social life at work - shared feelings, thoughts and actions at work construct us as workers. Those who can recognise this - who are open to their own learning possibilities (as 'whole persons' if you like) - can then advance such learning in others. Managers, for example, who are frequently leaders in some way, working with other humans (say, team-members, learners, patients, and clients), are increasingly expected to show leadership in their own performance of sophisticated 'people' skills. The current interest in 'emotional intelligence' has direct bearing on this (Goleman, 1996). If managers can create amongst their peers and their clients a climate, which nurtures everyone's creativity, they will have demonstrated the fusion of thinking, feeling and doing. They will have shown that integrable workplace learning is at the structural and cultural heart of the organisation in which they work. In terms of Aristotelian creativity, they will have *made* learning work, by giving practical judgments centre-stage in a new epistemology of workplace-based and workplace-located experiences.

*In this workshop, I want to show how the whole person is manifest in workplace practical judgments, and within those judgments, how the emotions (that is the affective domain) may be apparent amongst the cognitive and the social domains. But first some argument!*

## BRINGING THE BODY BACK IN

Workplace learning requires human embodiment, yet it seems to me curious that new educational technologies—culminating in the notion of a 'virtual' university—require the denial of that embodiment. New technologies in education, like the world of celebrity, glitter enticingly and their acolytes abound, but they play upon the coloured surfaces: they shimmer, without materiality, and they have a shadowy aspect. The non-material (that is to say, disembodied) learning which I believe flows from these new technologies relies upon a prior conversion of knowledge into information, which thus presents learning as a consumption of marketed 'education' packages. Universities are at the forefront of this, which is surely one of the great ironies of our times, given their historic provenance in substantial and material learning. Yet, in the corporate world, newfound interest in individuals' self-directed (even lifelong) learning, in groups' teamwork, and what some call broadly post-Fordist 'knowledge production', fleshes out humanist adult learning principles that virtual technologies cannot address well. Here are some examples. Coaching, mentoring, appraisals, professional development programmes, job rotation, project management, off-site and on-site training and so on, are all implicitly or explicitly learning opportunities. They assume an embodied worker, and assume humanist (rather than behaviourist) adult learning principles. People are expected to develop an enthusiasm for their own learning in the particular socio-cultural context of their workplace. Of course there are new material technologies which are deployed in these workplace-based activities—computer-assisted learning, e-mail, the web, and on-line courses and training packages with self-paced elements. But basically the contention here is that the corporate usage of new technologies stays closer to a more natural materiality (the 'embodied') worker than do the universities' rampant enthusiasm for new technologies. This enthusiasm, paradoxically and unnaturally, 'disembodies' the learner.

Yet in real time and real space, learners appear as embodied beings, in what Berge (1995) has called "synchronous interaction". However, in 'asynchronous' time and space, learners' embodiments are educationally irrelevant. They need not 'appear' in learning at all. We know they are out there, but their interactions are mediated by technologised time and space. This must affect the quality of learning, as I now suggest (cf Beckett, 1998).

Classroom dynamics and management have been a close focus of education research for at least three decades, perhaps since the realisation in the late 1960s that Western society was becoming more diverse and that, in schooling, one shoe no longer fitted all feet. Class sizes, gender- and ethnicity-related learning styles, teacher behaviours, activity-based and experiential pedagogies, assessment variables, and so on, have all been ingredients in debates about how *just being there* in a classroom as an individual learner-in-a-group improves one's education (or perhaps impedes it). Diversity has emerged locally, classroom by classroom, as a fact of teachers' and learners' lives. Rather late in all this, new information technology has arrived promising individualised (or self-directable) ownership of learning.

Now we can arrange learning environments through new technology which removes the need to 'just be there'—that is, in the room. At once, you may say, we have eradicated the pathology of the classroom: learners will no longer feel their very presence has generated an inscription on their bodies by others. Fat, thin, shy, squeaky-voiced, slow, boisterous, late, sleepy, hairy—the whole Seven Dwarfs roll-call—will be irrelevant in the new virtual learning environment. Learners can log on and off in their time, arranging their learning programme without regard for appearances in real time or real space. And isn't this a great advance?

Undoubtedly so. Yet at the same time as diversity and technology are engaging, our culture is coming to terms with a new emphasis on visual literacy. Perhaps the greatest cultural change we are facing is the shift from the primacy of the printed word to the primacy of the visual image. We live in an image-driven age. The visual and the virtual are intimately connected. But to what extent does the virtual, in educational settings, engage this new visual literacy? On-line courses can look very pretty, but to get anywhere with them, the learner-as-viewer requires fairly high print literacy, not just a visual literacy. Understanding the icons and images is not as helpful as being able to read the print instructions and then following the protocols. Moreover, in the absence of a real-time, real-space classroom, learners require (virtually, that is) all the instructions in great detail lest, in their real time, they lose their way. On-line subject material is, in this sense, ambiguous. With its visual appeal and immediacy (which persuades the learner that they can get along well with visual literacy), it *invites* learning, but to *achieve* learning, print literacy is essential. This is not merely an informational point, but an epistemological one. Hypertext links, which must be read as print and are presented as information, can leave a wide variety of sequenced, and randomised, pathways open to the learner. In terms of self-direction, this is exceptionally liberating. Smart minds can turn information into self-education, given half a chance. But in terms of *socio-culturally significant learning* (that is to say, information structured into knowledge claims) even the smartest minds need to know, eventually, what their peers think, and even what the teacher thinks, about the information they have cut and pasted into their own 'take' on the world. Furthermore, everyone expecting to learn 'on-line' needs a distillation of the previous attempts to establish, structure and overturn what counts as worthwhile knowledge. The information-presenting function of on-line courses (as an example of flexible delivery) is unquestioned. But as knowledge-presenting functions, such delivery is ambiguous. Like the huge shopping mall, the technology in itself invites the learner to buy, but only to satisfy mindless consumption. We learn because we have a social curiosity. We want to learn because we know our own limitations, our own ignorance. Self-direction, especially in front of the WWW, looks increasingly capricious. In the face of this, virtual learning needs, at the very point of learner experience, to be heavily structured. This is almost paradoxical. The paradox is compounded when we notice that the more divergent from printed text such on-line courses appear (the more they engage the visually-literate, perhaps), the greater they rely on traditional print literacy for navigation. Of course, new technologies permit flexible delivery, and require feedback. All manner of group-based networking, with and without the teacher, is possible, and assessment tasks can key in to these. This is true - and it is essential. But the more essential point remains: *the informationalised (even 'virtual') university offers an excessively individualistic educational ideology*, which, to avoid eccentric and idiosyncratic knowledge-claims emerging, structures masses of teacher input, in printed text format (Beckett, 2000b). It is, in brief, lonely and disembodied learning.

## THE WORKPLACE AND 'THE EROS OF LEARNING'

In contrast, lonely and disembodied learning is *not* what most workplaces provide. Work for most of us occurs in the here and now, in real time, and in real space, with real bodies present. I will now outline what it is about workplaces (including offices, factories, classrooms, training rooms, meeting rooms, conference halls and so on) that tends to generate high-quality learning, by concentrating on a phenomenon ignored by the rush to the new technologies. Some in education call this "the eros of learning".

The eros of learning is not the pursuit of the erotic-as-sexuality (although that may well be present). Instead, the recognition of the wider notion of the erotic-as-pleasure, and it is to be found in the work of the best practitioners (trainers, teachers, managers, mentors—anyone in a leadership role for learning at work). This occurs when they energise learners (including students, protégés, colleagues, subordinates and so on) with a love for the content, and a love for learning in itself. This is a professionally-responsible characterisation of the *enthusiasmos* which inspires learners to learn more. It typically happens in the real time in real work sites of real embodied people. This is the 'hot action' of the workplace (Beckett, 1996). It is, if you like, the erotification of learning in the sense that the dynamics of such classrooms play out the intentions presented in planned and accredited documents.

Notwithstanding this richer, humanistic reading of workplace activities, the point remains that 'informatised' programmes, delivered (rather than constructed) through new virtualisable technologies reduces the learner to disembodiment. And that, dear reader (not viewer!) reinstates the 'ghost in the machine': all mind plus mechanistic body (Ryle, 1949; Schon, 1987). This has been the picture of elite education of all kinds, for centuries, in grammar schools and Oxbridge, and, yes, amongst senior secondary credentials like the International Baccalauréate, and its equivalents around Western schooling (the academic mind reigns supreme). The effect of all this contributes to keeping workplace-based learning in its lowly place—as mechanistic, behaviouristic, and therefore, mindless, as unthinking.

## THE NEW PRACTICAL LEARNING

Let me swing the whole debate around and come at it from the other side. In dramatic contrast to the Cartesianism implicit in universities' enthusiasm for new technologies, the corporate workplace, wherever it is found in the Western world, is rightly serious about bodies and what they can do, and identifying this with thinking. What sort of learner is being constructed in the resort to and reliance upon these new technologies?

Workers are, it is argued (Beckett, 1999, 2000a, 2000c, Beckett and Hager, 2000) now and for the forseeable future, best regarded as integrated thinking and doing beings who exercise all manner of judgements during the working day—these are their *practices*. Following from these states of being, there are new, powerful and experientially authentic knowledge claims made of workers and of work which challenge the formality of traditional university-based education (see Hager in Symes and McLaren, 2000). For example, managers' 'know how' connects readily with the Aristotelian notion of *phronesis* —practical wisdom (Beckett, 1999).

Practical workplace learning across the corporate world assumes and expects the dissolution of the traditional (that is to say, 'modernist') mind/body Cartesian world, and its privileging of the 'pure' mind. It is the person, not merely the mind, which is significant, and persons are inevitably embodied. In the light of this 'post-modern' conceptual shift, the new material technologies in education, of which 'on-line' delivery is the most prominent, look a little arcane. More ominously, to the extent that these new technologies discount teaching in favour of the 'delivery' of learning, they impart an instrumentalism which enshrines the old Cartesian dualism between mental labour (thinking) and manual labour (doing). Instead, let us investigate workplace practice.

## PRACTICAL JUDGMENTS AND THE WHOLE PERSON

Attention to learning from informal experience will come as no surprise for any of us who are parents, or who for some time have been involved in what is typically the work of professionals, such as lawyers, teachers, medicos, and nurses. This is because such activities as these deal in human values and actions with consequences for which one is held responsible, such as child-rearing, technical and clinical diagnoses, litigation, and so on. All these activities require *practical judgment*, that is, decisions about what to do next to bring about the most efficacious result - the 'practical', or appropriate, or tailor-made solution to what ever is the issue or problem. These judgments have not, traditionally, entered much into the theory-driven acquisition of a formal education, but now universities are being forced to re-think that tradition (Hager and Beckett, 1998).

In fact, the 'given' context requires its expression in creative work. A vision *un*realised is a waste of time: it is *un*integrated into daily corporate life. It is in being 'worked upon' (Schon would say: in the artistry of performance) that workplace learning emerges. What psychologists call 'situated learning' is the most powerful workplace learning, because humans are immersed in their daily activities, from which they are especially susceptible to learning. Such immersion involves the totality (the 'wholeness') of experience, which, as we noted at the outset, is central to such learning: understanding, feelings, and with whom this occurs - the sociality of the workplace - are each intertwined therein.

## TWO WORKPLACES: TWO CONTEXTS (- TRANSCRIPTS WERE DISTRIBUTED, NOW INCLUDED HERE)

For the empirical part of this paper, I draw on interviews with two practising professionals (part of a larger project: see Hager, 2000, Beckett and Hager, 2000; building on Lipman (1991), Nonaka and Takeuchi (1995) as well as that of Dewey and Aristotle).

In these judgments, individuals 'attend' to their total perceptions of their workplace: the cognitive (reason-based), affective (feelings, wants) and social (group and team allegiances) aspects of these perceptions are only artificially separable.

### Two Interviews -

#### Respondent One: The Ambulance Officer

> *Respondent:* ...And the little baby certainly wasn't breathing. The first decision is - do you start resuscitation or not? And there's a whole set of rules that we have about when you do and when you don't start resuscitation. So I made the decision to start...My partner was more frazzled by the situation than I was. He and I had an interesting relationship at that time because he was in a superior position, theoretically, but in practice and knowledge I was ahead of him. So that made it awkward, and he knew that. He felt very uncomfortable about it, and I did too - because of the way he treated me because of that. So the relationship was on the face of it harmonious, but it had some undercurrents that made things difficult. And this resuscitation brought those out because I'm used to resuscitating children, and so I just went into that role. And he wasn't, and he didn't. So we resuscitated the little baby, and we actually got an output, which means that we got some heart rhythm back - which in these circumstances was very unusual and quite unexpected - well not unexpected but unusual. And so another crew arrived, which was the intensive care crew, and so they helped us to continue to resuscitate. Eventually we had to stop.
>
> So I suppose decisions that I made were things like- which equipment to use and when; how to help my partner through it, because he obviously wasn't coping very well with it. He had little kiddies the same age, so apart from the conflict he and I had, I could see it was hard for him anyway. Then dealing with the family obviously was difficult. It is very difficult in the ambulance world because they actively encourage

the family to stay around for resuscitation, whereas in nursing they are not as progressive in that way. So it is very difficult doing resuscitation with the family watching, than it was in a hospital where you put them out the door and when it's all over you bring them in again. So during the resuscitation, I had to decide when to speak to them - and when you know, when you're pretty sure that you're not going to get the little baby back - you give them a warning before you stop. And so you have to decide when to do that and how to phrase it. And there's a decision that we've made collectively as a group of officers about whether to stop the resuscitation or whether to keep it going or not.

*Interv:* - You do that collectively?

*Resp*: - Yes. Once it's all finished, you talk to the family about it. and give them some time with the baby. And there's a whole set of protocols about where you take the baby's body and call the police.

*Interv*: - So the police arrive while you're there?

*Resp*: - Yes they did, and that's routine........it's difficult dealing with the death of children obviously. But I've developed some techniques for dealing with that.

*Interv:* - How have you done that?

*Resp:* - Through exposure I suppose and exploring how my feelings play a part, particularly in my decisions, because after I've been in a situation where I make judgments about things, or just my everyday job - this is from quite a few years ago I started doing this. Looking at what role my emotions played in it, I found that the more dissatisfied I was with how I performed, the more my emotions had played a less than constructive part in the job. So I don't believe you can keep your emotions right out of it or have your emotions controlling the situation. And I think you need to have a balance somewhere in between, and so I'm getting to the point - and I'm practising it - I don't say I do it that well - actually I like to think I do it pretty well. I find it easy to do a job now and keep my emotions right out of it, and think about it later on. And I think that's a step up for me from having my emotions play a part and affect my judgments. And that's a step up from not having your emotions in there at all.

So now I'm getting to the point where I like to be able to feel my emotions at the time, and still have them not impact upon the appropriate judgments and the decisions that I make - and that's complex.

Respondent Two: Private School Principal

*Interv:* - ...Where you get resistance to decisions - perhaps with staffing implications - that people wouldn't be comfortable with, or parents not comfortable with, and people land on your doorstep with a gripe, what do you bring to the resolution of these situations?

*Resp:* - I bring to it an instinct - an instinctive feel for how it fits within our culture and how it fits within our future. Now of course I don't think that I'm conceited because I actually argue with myself all the time but obviously I think my instinct is right. ...

*Interv:* - And you'd have a series of these decisions across several days or across the working year, which could be routine for you, because they are utterly consistent with the way in which you read the situation, or read the culture.

*Resp:* - Yes.

*Interv*: - Where the organisation has faced external constraints such as the planning difficulties I read about with your extensions and development - that kind of thing - when you have to make judgments of an overtly political nature involving the media, the local press, and so on, what do you bring to those sorts of judgments?

*Resp:* - Well you already know what your own plans are in terms of seeking advice on what you're prepared to do. What is right to do – what is ethical and appropriate. And you may have noticed if you are local that I made a decision very early on that I wasn't going to talk to the press. So that was the end of it. But it has been in the press with the comment that the principal hasn't returned a call or wasn't available. That's fine.... You have to know what you're doing for your own organisation is right in the first place. You have to be very sure about that.....

*Interv*: - .... I wanted to build on the idea of what I take to be reliance on intuition.

*Resp:* - Right. Huge. Huge.

*Interv*: - So when I say, and you say, 'the reading of the culture', a lot of that is intuitionistic?

*Resp*: - And a build up of that experience. If you'd interviewed me say six or seven years ago – different, different totally.

*Interv*: - But can we formalise that more in knowledge-based terms so that you can say - 'Look I'm the principal and I've got this depth of experience: It's different from when I started the job. I'm able to say just by rule of thumb. I can exercise judgments that I know are going to be more or less effective'.

*Resp:* - Oh yes.

*Interv:* - So even against the odds you might pull something off with the council, staff, or people within the community because you backed a hunch that you could really formalise this knowledge.

*Resp:* - Oh. I do that quite a bit and I'm always pleased when it's something that is my idea that a lot of people didn't want at the time. We just sort of say OK well we'll try it and the people find they actually do like it. However we also try and work in a team way on a whole variety of decisions but another thing I'd say, I can't remember in my ten years working with the school council (and their culture has changed too and some of that would be my influence...), I can't remember anything that I've asked for that doesn't happen. ...

*Interv:* - Now, based on that, I'm picking up the feeling that it's important for you that a challenging judgment is something that shouldn't really arise in an ad hoc or unforeseen fashion. It's very important to have it thought through, deliberated upon, well resourced, justified, and so on. So I'm wondering if in the daily course of your work there is very much reliance on the emotions, feelings.

*Resp:* - What sorts of feelings?

*Interv:* - Trusting them.

*Resp:* - When it comes to trusting them?

*Interv:* - Yes, instinct is fine, but this sort of warmer, fuzzier idea of feelings.

*Resp:* - No I don't think so - not if it's got to be cool objective thinking..... I think I'm being utterly objective when I can disassociate myself from feelings, friendships, and other alliances and say look at the big picture, look at this, look at that. So no I don't think so.

*Interv:* - So if somebody walked in to see you and they had a particular problem and they dissolved into a flood of tears - would you be less likely to modify the point of view that you had?

*Resp:* - I don't know. I'd - depending on who it was - I'd put my arm around them and want to solve their personal problem first and then deal with the rest of it... Two other things, unrelated but maybe not, I love it when someone walks through my door and says 'I've done something terrible: I've got the most dreadful problem you can imagine', because I instinctively know it's going to be the most easy thing to solve of the lot.

But secondly, if someone - as will happen today - walks through my door for an

> interview - then when I'm choosing people for interview to come and work here, as you know from research, the CV goes out the window the minute they come through the door and instinct takes over but also a little bit of that is feelings. And even though they may not fit your criteria, they're some of the most critical judgments I ever make for the school - picking the right people....It's my principal job - getting the right people into this school.

## CONCLUSION

Summarising the workshop discussion, we may state that working knowledge in its 'whole person' or organic form will be marked by

(1) the *contingent* - the informal, non-routine and capricious nature of daily work is overtly decisional;

(2) the *practical* - the need to solve problems efficaciously (the Aristotelian 'good' result) is paramount;

(3) the *process* - Schonian reflection-on-action has generated expectations of professional growth;

(4) the *particular* - the need to address the here and now with compromise is accepted by our interviewees;

(5) the *affective and the social domains* - judgments are basically (but not entirely) value judgements; because which cognitive considerations are entertained depends on how they can be made sense of , cognitively, emotionally and ethically.

## REFERENCES

- Argyris, C. and Schon, D, (1978). *Organisational Learning: A Theory of Action Perspective*. Addison-Wesley: London
- Aristotle (ed. McKeon), (1941). *Basic Works*. Random House: New York
- Beare, H. and Slaughter, R., (1993) *Education for the Twenty-First Century*. Routledge: London
- Beckett, D., (1992)."Straining training: the epistemology of workplace learning", *Studies in Continuing Education*, 14(2): 130-142.
- Beckett, D., (1996). "Critical judgement and professional practice", *Educational Theory*, 46(2): 135-150.

- Beckett, D., (1998). "Disembodied learning: how flexible delivery shoots higher education in the foot: well, sort of", *Electronic Journal of Sociology*. 3 (3): 1-6. (www.sociology.org)
- Beckett, D., (1999). "Past the guru and up the garden path: the new organic management learning", in D. Boud and J. Garrick (eds) *Understanding Learning at Work*. Routledge: London
- Beckett, D., (2000a). "Workplace Learning as Postmodernist Enactment: A Model from Dementia.", *Journal of Vocational Education and Training* (forthcoming)
- Beckett, D., (2000b). "Eros and the Virtual: Enframing Working Knowledge Through Technology", in C. Symes and J. McLaren (eds) *Working Knowledge: The New Vocationalism and Higher Education*. Open University Press: London.
- Beckett, D., (2000c). "Workplace Learning: Judgements in Practice.", *Futures* (forthcoming)
- Beckett, D. and Hager, P., (2000) "Making Judgments as the Basis for Workplace Learning: Towards An Epistemology of Practice.", *International Journal of Lifelong Education* (forthcoming)
- Bellini, J., (1999). "Emotions will rule in 2025: Futurist.", *The Age* Oct 13 1999 (Business p1). Melb.
- Bennis, W., (1997). "Becoming a Leader of Leaders", in Gibson, R. (ed.) (1997) *Rethinking the Future: Rethinking business, principles, competition, control and complexity, leadership, markets and the world*. Nicholas Brealey: London
- Berge, Z., (1995). "Facilitating computer conferencing: recommendations from the field", *Educational Technology*. Jan-Feb. 22-30.
- Boud, D. and Garrick, J. (eds.), (1999). *Understanding Learning at Work*. Routledge: London
- Csikszentmihalyi, M., (1992). *Flow: The Psychology of Happiness*. Rider: London
- Dewey J., (1916) *Democracy and Education*. Free Press: New York (1966 edition).
- *Educational Philosophy and Theory*, (1999). “Theme Issue: Practical Reasoning”. 31:3
- Ferry N.M. and Ross-Gordon J.M., (1998). "An Inquiry Into Schon's Epistemology of Practice: Exploring Links Between Experience and Reflective Practice", *Adult Education Quarterly*, 48(2), 98-112.
- *Futurework: Trends and Challenges for Work in the 21st Century*, (1999). Report: United Sates of America Dept of Labour.
- http://www.dol.gov/asp/public/futurework/execsum.htm
- Garrick, J., (1998). *Informal Learning in the Workplace*. Routledge: London

- Gibson, R. (ed.), (1997). *Rethinking the Future*. Nicholas Brealey: London
- Goleman, D., (1996). *Emotional Intelligence: Why It Can Matter More Than IQ*. Bloomsbury: London
- Hager P., (1996). "Professional Practice in Education: Research and Issues", *Australian Journal of Education*, 40 (3), 235-247.
- Hager P. (1997). "Learning in the Workplace". *Review of Research Monograph Series*. National Centre for Vocational Education Research: Adelaide
- Hager, P, (2000). "Knowledge That Works: Judgement and the University Curriculum", in C. Symes and J. McLaren (eds) *Working Knowledge: The New Vocationalism and Higher Education*. Open University Press: London.
- Hager, P. and Beckett, D., (1995). "Philosophical Underpinnings of the Integrated Conception of Competence.", *Educational Philosophy and Theory*. 27 (1), 1-24
- Hager, P. and Beckett, D., (1998). "What Would Lifelong Education Look Like in a Workplace Setting?", in *International Perspectives on Lifelong Learning*. J. Holford, P. Jarvis and C. Griffin (eds.). Kogan Page London.
- Handy, C., (1997). "Finding sense in uncertainty", in R. Gibson, R. (ed.) *Rethinking The Future*. Nicholas Brealey: London
- Lipman M., (1991). *Thinking in Education*. Cambridge University Press: Cambridge.
- Lyotard, J-F., (1993). "New Technologies", in J-F Lyotard, *Political Writings* (trans B. Readings and K. Geiman) University of Minnesota: Minneapolis
- McLellan, M. (ed.), (1996). "Situated Learning Perspectives". *Educational Technology Publications*: Englewood Cliffs, New Jersey USA.
- McWilliam, E. and Palmer, P., (1996). "Pedagogues, tech (no)bods: reinventing postgraduate pedagogy", in McWilliam, E. and Taylor, P. (eds) *Pedagogy, Technology, and the Body*. Peter Lang:New York
- Nonaka I. and Takeuchi H., (1995). *The Knowledge-Creating Company*. Oxford University Press: Oxford and New York.
- Norris, D. and Dolence, M., (1996). "IT leadership is key to transformation", *Cause/Effect*, 19(11): 11-20.
- Peters, M. and Roberts, P., (eds.) (1998). *Virtual Technologies and Tertiary Education*. The Dunmore Press: Palmerston North, New Zealand
- Ryle, G., (1949). *The Concept of Mind*. Hutchinson and Sons: London
- Schatzki, T., (1996). "Practiced bodies: subject, gender, and minds", in T.Schatzki and W. Natter (eds) *The Social and Political Body*. Guildford Press: London
- Schon, D., (1983). *The Reflective Practitioner*. Basic Books: New York

- Schon, D., (1987). *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions*. Jossey-Bass: San Francisco
- Scott, P., (1991). *The Postmodern Challenge*. Trentham Books: Stoke-on Trent UK
- Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organisation*. Doubleday: New York
- UNESCO, (1999). "Lifelong Learning and Training: A Bridge to the Future". *Main Working Document. Second International Congress on Technical and Vocational Education,* Seoul, April. UNESCO, Paris
- *Virtual University Journal*, (1998). Vol 1 No 1. http://www.openhouse.org.uk/virtual-university-press/vuj/
- Wall, L., (1999). *Perl: The First Postmodern Computer Language*. http:www.wall.org/-larry/pm.html
- Winch, C., (1998). *The Philosophy of Human Learning*. Routledge London
- Wittgenstein, L., (1953). *Philosophical Investigations*. Basil Blackwell, Oxford

TEND 2000

## Crossroads of the New Millennium

# Flexible Delivery Is Not Simply A Question Of Technology

Prepared and Presented

By

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Saturday 8 April, 2000

Workshop 2

# Abstract

The late 90s have seen educators riding on the wave of technological advancements in their pursuit of the ultimate flexible delivery model. In more recent times, however, I believe we have been caught in the backwash of some of these advances.

The UAE was founded using the "mechanics of a modern administrative structure" yet at the same time "ensuring that the best of the traditions of the past are maintained, adapted and preserved"[1] It is this same 'mixing of the options' that underpins the very successful flexible, workplace delivery programme at South West TAFE, Australia.

Our geographical isolation has meant that we have been committed to flexible, distance based learning for many years. In 1997, we were part of a project team that developed the first online office skills delivery model in Australia. Our experience has enabled us to draw on those positive aspects of traditional classroom structures and combine these with the positive benefit that technology has to offer.

This paper (and subsequent workshop) will review this educational model and highlight the philosophy behind its development. Specific case studies have been included so as to provide some insight into the practical strategies that have ensured the ongoing success of this programme at South West TAFE.

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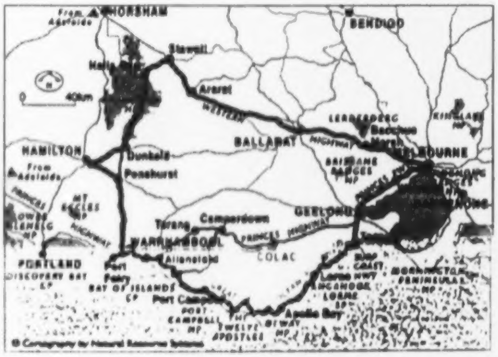
[1] *The United Arab Emirates – Interactive CD ROM, Trident Press Ltd. 1996*

# Flexible Delivery Is Not Simply A Question Of Technology

## BACKGROUND

Australia is a large country (land mass approximately the same size as the USA) with a population of approximately 19 million. Much of this population is concentrated in coastal cities. The South West Institute of TAFE (Technical and Further Education) is located Victoria, with campuses in the regional cities of Warrnambool (http://www.warrnambool.vic.gov.au/welcome/index.shtml), Hamilton and Portland.

AUSTRALIA
BRISBANE
SYDNEY
ADELAIDE
MELBOURNE
VICTORIA
HOBART


HORSHAM
BENDIGO
Stawell
Ararat
BALLARAT
MELBOURNE
HAMILTON
Dunkeld
Penshurst
GEELONG
Camperdown
COLAC
WARRNAMBOOL
PORTLAND
Port Fairy
Port Campbell
Lorne
Apollo Bay

http://www.tourism-victoria.aone.net.au/indextvsbp.htm

Our geographical isolation has meant that we have been actively committed to flexible, distance based delivery for many years. In 1997, we developed an online workplace delivery model for use by administrative and clerical workers in partnership with the Royal Melbourne Institute of Technology. This model aligned itself to the National Clerical-Administrative Competency Standards, 3rd Edition that encompasses the formal qualifications - Certificate II, III, IV and V in Office Administration.

The delivery model aimed to service clerical and administrative workers who, at the time, represented approximately 15% of the Australian workforce. Of significance was the fact that approximately 70% of these workers did not have any formal credentials (BSITB Industry Training Plan Update 1995/98). Using new learning technologies was deemed to be appropriate for this group given that clerical and administrative workers are generally computer literate and should therefore adapt well to the online environment.

## INTRODUCTION

Since our involvement in the 'Australia first' office skills online project, we have continued to enhance the model, drawing upon those positive aspects of traditional classroom structures and combining them with the benefits that new technologies have to offer. Our goal has been to support the continually shifting paradigms from centralised, teacher focused learning, to distributed client focused approaches.

Our experience has enabled us to identify three key features of a successful flexible delivery model incorporating design, facilitation and management.

1 The development of an appropriate technological infrastructure. The workshop will include a demonstration of the Office Skills Online website.

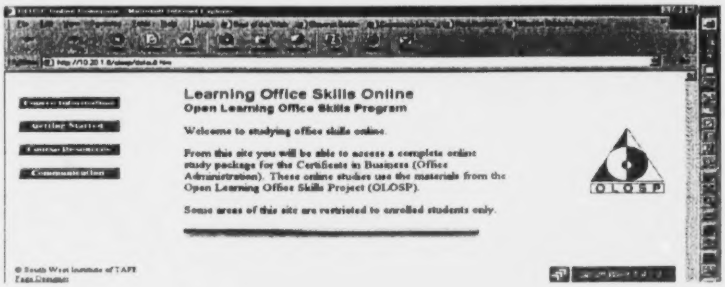
2 The development (or enhancement) of training materials specifically designed for online delivery. The workshop will sample these materials, highlighting the fact that they are not simply paper-based materials 'placed online'.

3 The implementation of workplace training plans. The workshop will review specific case studies highlighting the successful incorporation of the technological infrastructure, adapted training materials and workplace training plans.

## THE DEVELOPMENT OF THE MODEL

When first developing the storyboards for the Office Skills Online website (www.swtafe.vic.edu.au/olosp), our primary objective was to identify those features that focused on enhancing the learning. Despite the novelty of the Internet, our brief was to ensure that we were not merely utilising technology for technology's sake. We wanted to develop a generic infrastructure that was built on sound technical and pedagogical principles.

Figure 1 – Learning Office Skills Online Homepage



Learning Office Skills Online

Open Learning Office Skills Program

Welcome to studying office skills online.

From this site you will be able to access a complete online study package for the Certificate in Business (Office Administration). These online studies use the materials from the Open Learning Office Skills Project (OLOSP).

Some areas of this site are restricted to enrolled students only.

The result was a web site that is:

- logical, efficient and user friendly in its layout and design features
- designed to encourage group synergism, and
- inclusive of features to ensure ongoing functionality.

Our design process acknowledged the fact that many of our potential students would have a variety of equipment standards when accessing our site. As such, we wanted the layout to be clear and

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simple…both from visual and technological perspective. Given the volume of information needed to be included, consistency of presentation was critical. This included framing each secondary screen with the sites main selections, providing ready access to help functions and generally ensuring that the student had a strong visual sense of their location within the site.

We have minimised the use of graphics and animation. At the time of the initial development, budgetary constraints were a major variable impacting on this decision. However, it has since been agreed that, although visually attractive and even entertaining at times, the benefit of these features is minimal. Our goal has always been to concentrate on the real areas of impact, rather than the 'bells and whistles'.

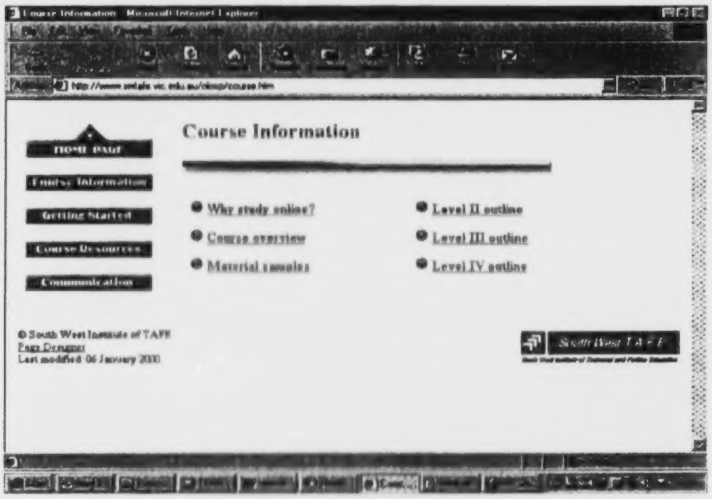
Although 'scrolling' is often noted as an undesirable feature of a website, we knew our target audience would most likely print out the bulky text items that they would need to make multiple reference to. As such, we have not viewed this as a negative feature.

As part of our commitment to a logical, efficient and user friendly layout, we divided our site into four key areas:

## COURSE INFORMATION

When you venture into online delivery, you are making known your intentions to market your products or services around the world. This part of our site is dedicated to this task offering the opportunity for potential students (and competitors) to browse.

**Figure 2 – Course Information**



Course Information

- Why study online?
- Course overview
- Material samples
- Level II outline
- Level III outline
- Level IV outline

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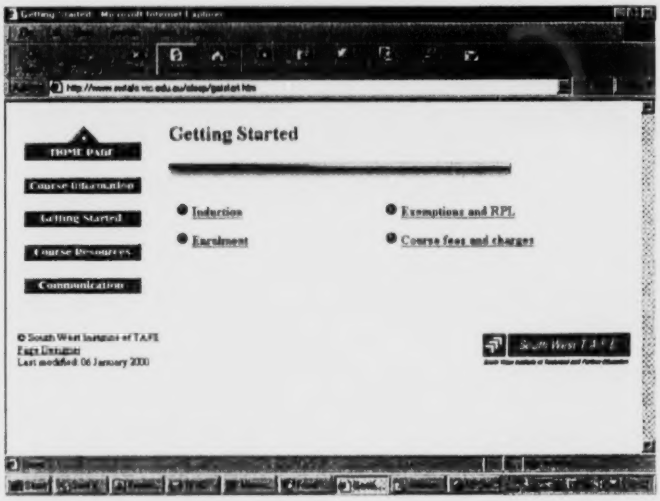
## GETTING STARTED

Just as you would offer an on-site or on-campus orientation, the website also accommodates this necessary function in the educational process. Our intention here is to answer all those questions we as educators know will be asked in the first class.

**Figure 3 – Getting Started**


Getting Started
HOME PAGE
Course Information
Getting Started
Course Resources
Communication
Induction
Enrolment
Exemptions and RPL
Course fees and charges
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## COURSE RESOURCES

In this section of the site, we aim to provide our online students with access to the 'typical' student services that are available to our on campus students.

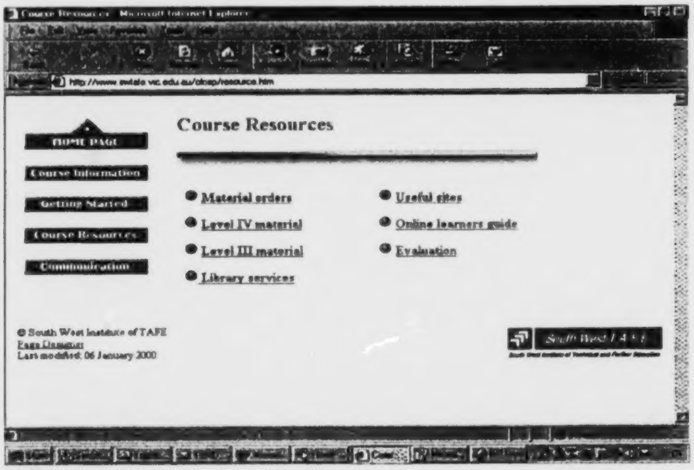
Course Resources
HOME PAGE
Course Information
Getting Started
Course Resources
Communication
Material orders
Level IV material
Level III material
Library services
Useful sites
Online learners guide
Evaluation
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**Figure 3 – Course Resources**

There are also some unique services available to our online students including library loans and ordering of course materials.

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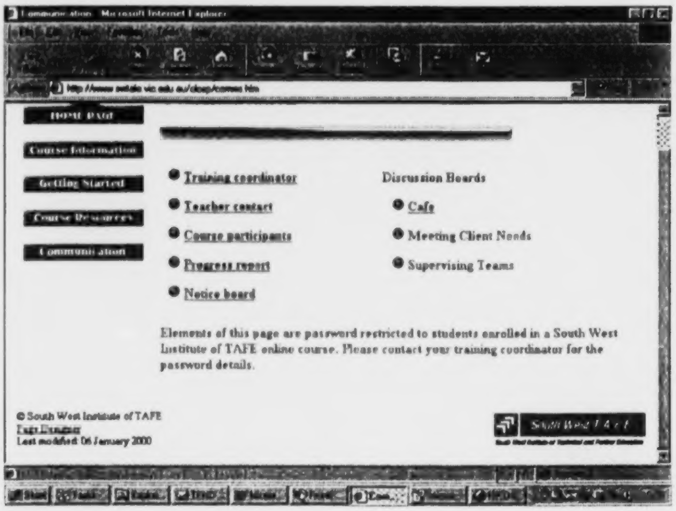
## COMMUNICATIONS

The decision to undertake study in a flexible/off campus manner has in the past been a relatively lonely and challenging way in which to learn. Initial contact has traditionally been administrative with subsequent interaction revolving around the submission of assignments.

One of the goals of our website is to nurture and encourage group synergism thus making the communication section the most dynamic component of the website. It is here that we have most effectively put to use the new technologies in a way that emulates the positive features of our traditional classroom structures that stimulate communication and collaboration.

**Figure 4 – Communications**



- Training coordinator
- Teacher contact
- Course participants
- Progress report
- Notice board

Discussion Boards

- Cafe
- Meeting Client Needs
- Supervising Teams

Elements of this page are password restricted to students enrolled in a South West Institute of TAFE online course. Please contact your training coordinator for the password details.

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Our goal has been to provide a platform that will support the interaction between students and staff, whilst at the same time minimising the intrusion into the workplace. It should be noted that without the development of learning materials that target the use of this infrastructure, you would have little more than a glorified chat room.

We have created an informal area for communicating that we refer to as our café as a way of nurturing the online learning community.

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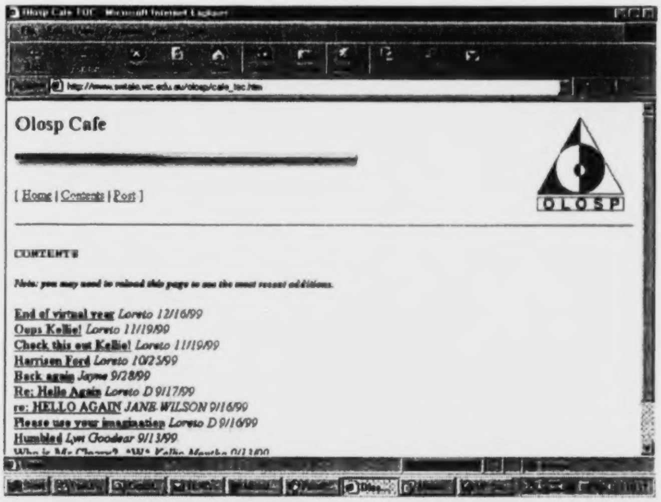
**Figure 5 – Extract from the Café**


Olosp Cafe TOC - Microsoft Internet Explorer
http://www.swtafe.vic.edu.au/olosp/cafe_toc.htm
OLOSP

Olosp Cafe

[ Home | Contents | Post ]

CONTENTS

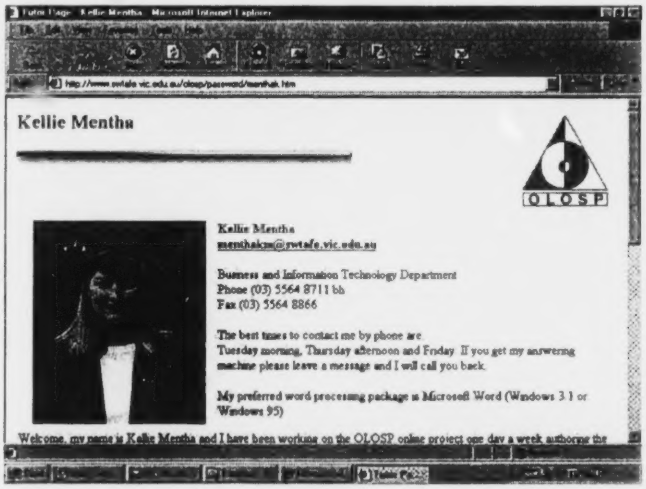
*Note: you may need to reload this page to see the most recent additions.*

End of virtual year *Loreto 12/16/99*
Oops Kellie! *Loreto 11/19/99*
Check this out Kellie! *Loreto 11/19/99*
Harrison Ford *Loreto 10/25/99*
Back again *Jayne 9/28/99*
Re: Hello Again *Loreto D 9/17/99*
re: HELLO AGAIN *JANE WILSON 9/16/99*
Please use your imagination *Loreto D 9/16/99*
Humbled *Lyn Goodear 9/13/99*

It is here that we first invite the students to practice their online conferencing skills prior to participating in the more formal subject conferences. Although enthusiastic to participate, the constraints of the technology can often be intimidating.

We have also provided students the opportunity to view a profile of their teacher(s). As well as providing general logistical details, our teachers are able to open the communication channels by anticipating some of the likely questions to be asked, just as one would expect to have happen on the first day of classes.

**Figure 6 – Teacher Profile**


Tutor Page - Kellie Mentha - Microsoft Internet Explorer
http://www.swtafe.vic.edu.au/olosp/password/menthak.htm
OLOSP

Kellie Mentha

Kellie Mentha
menthakm@swtafe.vic.edu.au

Business and Information Technology Department
Phone (03) 5564 8711 bh
Fax (03) 5564 8866

The best times to contact me by phone are
Tuesday morning, Thursday afternoon and Friday. If you get my answering machine please leave a message and I will call you back.

My preferred word processing package is Microsoft Word (Windows 3.1 or Windows 95)

Welcome, my name is Kellie Mentha and I have been working on the OLOSP online project one day a week authoring the

We also like to include the profiles of each of our students. Despite all the 'groans and moans' we often receive (particularly if a photo is involved), we find this one of the most visited sections of our site. We

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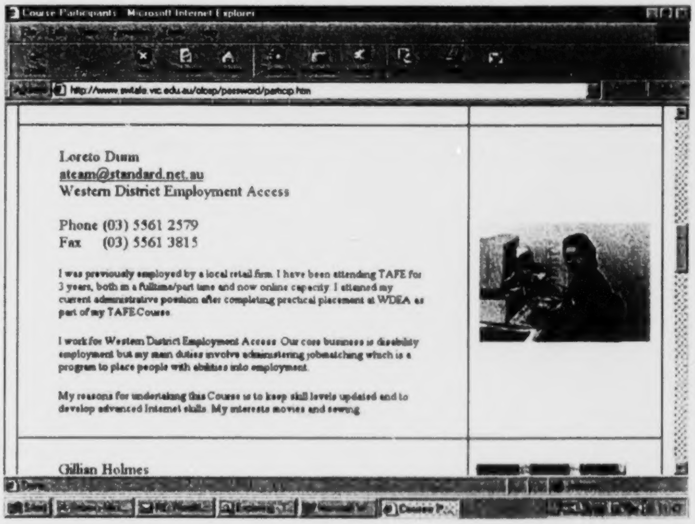
believe that not only do students like to see themselves, they also like to feel that they are part of a wider student body, thus contributing further to the nurturing of group synergism. We include the general details and photos (if available) and require that the student e-mail a brief commentary.

**Figure 7 – Student Profiles (extract)**


Course Participants - Microsoft Internet Explorer
http://www.swtafe.vic.edu.au/olosp/password/particip.htm

Loreto Dunn
ateam@standard.net.au
Western District Employment Access

Phone (03) 5561 2579
Fax (03) 5561 3815

I was previously employed by a local retail firm. I have been attending TAFE for 3 years, both in a fulltime/part time and now online capacity. I attained my current administrative position after completing practical placement at WDEA as part of my TAFE Course.

I work for Western District Employment Access. Our core business is disability employment but my main duties involve administering jobmatching which is a program to place people with abilities into employment.

My reasons for undertaking this Course is to keep skill levels updated and to develop advanced Internet skills. My interests movies and sewing.

Gillian Holmes

To further encourage interaction, much of this section is passworded. This not only ensures confidentiality of student and staff details, but it also generates a level of confidence amongst the students that fosters communications.

Although there are many other features of the site, the overview provided of the four key features (Course Resources, Getting Started, Course Resources and Communications) highlights the goals of the model; namely, to create a technical infrastructure that is logical, efficient and user friendly in its design, with a primary focus on encouraging group synergism.

## THE DEVELOPMENT (OR ENHANCEMENT) OF TRAINING MATERIALS

To create an effective learning environment, functionality is required at two levels. The first level is organisational.

Although not wanting to discourage exploration of new concepts through the allocation of seed funding, I believe the organisational preparedness greatly influences the long-term success of any technological based development. In recent times, many educational sites have been developed as a result of project based funding. Because they are often leading edge, there is typically an absence of organisational

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infrastructure to provide ongoing support for the project. The outcome is that the project is often prevented from being easily integrated into the existing environment therefore minimising any tangible long-term benefits stemming from the project.

At South West TAFE we have recently introduced a new flexible delivery department. The goals of this department are not to create a new internal delivery unit; rather, they are to provide the support and training required to vest the skills for flexible delivery back within the individual academic departments at South West TAFE. We want our staff to feel as if they are positive participants in the change, rather than victims of the change believing that "the presence of a shared vision generates a much higher degree of openness, candor and curiosity"(Senge, 1994:82)

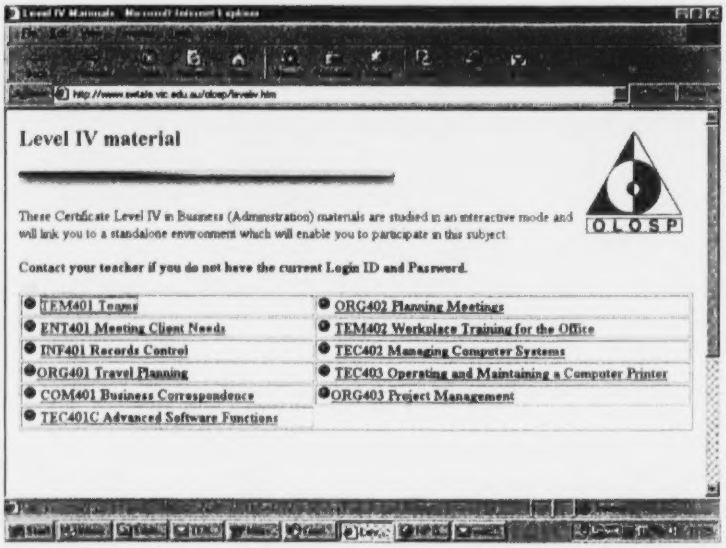
At the same time, the unit is committed to creating an appropriate technological framework to support new developments. In this way, new developments can be encouraged and pursued from within the individual academic departments, whilst at the same time offering the organisation the chance for long-term benefits. The overriding goal is consistent with Kanter's (1992) view that "the change should not be viewed as an event, but rather as a process aimed at organisational improvement".

The second level of functionality is at the student/user level. To ensure functionality, it is critical that developers of flexible delivery models are committed to the principle that there is more to flexible delivery than simply putting paper based materials 'online'. The goal of the design should be for a product that is rich in interactivity. The students participating in the learning process should be encouraged to visit the site regularly because of its ongoing contribution to the learning process. Without this imbedded concept, access to the site will be limited thus raising the question of the need to invest the resources required to develop and maintain the environment. As a final design element, the resources must be constructed in a way to measure that learning has taken place within the flexible learning model.

Ensuring functionality requires the development (or enhancement) of learning materials to suit the academic model. It should be noted that not all learning materials have to be online for a flexible delivery model to be effective. For the Office Skills Online programme, we identified a variety of learning needs. At Certificate II and III, the skills are foundational, with each module an entity unto itself. As such, we felt that the existing paper based materials (OLOSP) were ideal for the training required, as they are comprehensive and expansive in their detail. The online enhancements to these levels included the access to a dynamic communications environment, online materials ordering system and student service facilities.

At Certificate IV we identified the need for students to gain broad information access via a wide range of learning materials thus stimulating discovery learning. Our goal at this level is to encourage self-management, creative problem solving, teamwork and holistic learning. Because of the obvious benefits of the Internet, the resources for this Certificate were modified and located online. These enhancements are seen as value adding to the existing resource materials.

Figure 8 – Certificate IV Resources


Level IV Materials - Microsoft Internet Explorer
http://www.swtafe.vic.edu.au/olosp/leveliv.htm
OLOSP

**Level IV material**

These Certificate Level IV in Business (Administration) materials are studied in an interactive mode and will link you to a standalone environment which will enable you to participate in this subject.

**Contact your teacher if you do not have the current Login ID and Password.**

- TEM401 Teams
- ENT401 Meeting Client Needs
- INF401 Records Control
- ORG401 Travel Planning
- COM401 Business Correspondence
- TEC401C Advanced Software Functions
- ORG402 Planning Meetings
- TEM402 Workplace Training for the Office
- TEC402 Managing Computer Systems
- TEC403 Operating and Maintaining a Computer Printer
- ORG403 Project Management

The design of the module presumes a combination of online access and downloading (printing). Extensive online references are included, along with the opportunity to download study guides and assessment tasks. Finally, the study guides are structured to encourage students to visit the café and conferencing facilities in an ongoing manner.

Figure 9 – Supervising Teams Module

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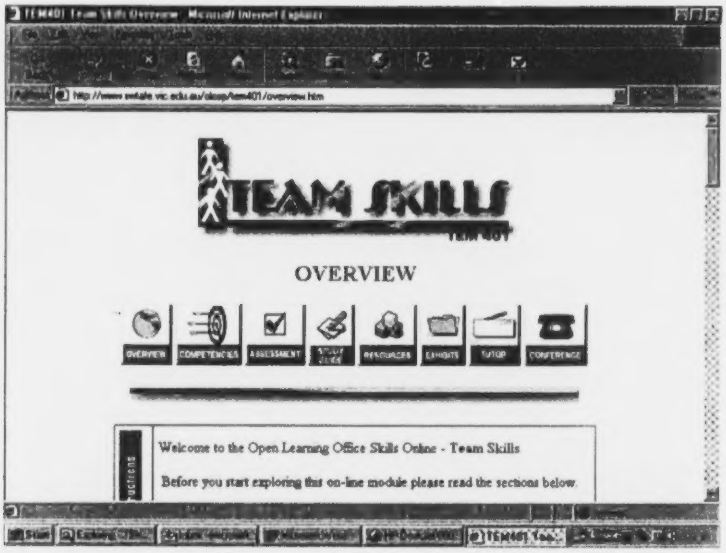

Welcome to the Open Learning Office Skills Online - Team Skills

Before you start exploring this on-line module please read the sections below.

At present, there are minimal resources available to support Level V training in a flexible delivery model. "Level V is the highest level of Administration Competency Standard. The best pedagogical model at this level of competency is a heuristic one that encourages learners to discover for themselves. This entails giving learners control over their learning environment, their pace of learning, and the manner in which they learn. It also involves placing the onus for learning on the learner, but in a highly supported environment that makes the best use of the technology and its communication facilities" (Flexible Delivery Toolbox ANTA Project – SWIT December 1999)

In December 1999, South West TAFE was awarded a major contract to develop the resources for Level V of the Office Administration training stream. Our task will be to develop a set of multimedia resources that provide a framework for the development of training programmes for online delivery. Once developed, these materials will be incorporated into the office skills online website.

As mentioned earlier, both student and teachers alike frequent our website. As such, we have passworded much of the content of the course resource section to enable us to maintain our competitive edge. Sample modules will be available for viewing as part of the workshop.

## THE IMPLEMENTATION OF THE MODEL USING WORKPLACE TRAINING PLANS

To date, the focus has been on the physical structures necessary for a successful flexible delivery model; namely, the website and the relevant learning resources. Equally, if not more important, is the role of the teacher and the administrator in this model.

Even within the traditional model of classroom based learning, fancy desks and chairs offer little support in the absence of an effective teacher at the front of the room guiding the learning process. Because of the literal absence of a classroom in a flexible delivery model, the role of the teacher is even more important.

Inappropriately, many educational organisations have viewed flexible delivery as a possible cost cutting opportunity. Traditionally, many organisations have approached the delivery of off campus studies from an administrative perspective. Academic involvement was largely reactive in response to student inquiries and assignments. In addition, there has been an ongoing belief that offering courses flexibly can dramatically increase student numbers thus possibly offering some economies of scale and thereby increasing productivity levels.

Our experience at South West TAFE has revealed that, in order to effectively manage flexible delivery, the workload and expectations on academic staff (both at an administrative and teaching level) has significantly increased. "We live in a world of change. Demographic changes, environmental changes, technological developments and reforms in education and training are impacting on the role of all (TAFE) teachers. As a teacher you are required to perform a wider range of functions and use a broader range of skills than ever before". These demands include the need to surrogate the class/group interaction, to customise the training plans to match the individual and workplace and the need to make yourself available to meet the 'on call ' nature of flexible delivery.

At South West TAFE, a three point plan is undertaken by the course co-ordinator /administrator to ensure the successful implementation of the flexible delivery model:

- **ANALYSE - Review the student's history to identify an appropriate entry point.**

As noted in my introduction, a large percentage of clerical workers in Australia do not have any formal credentials. Yet the reality is that, through extensive on the job work experience and training, they have often accumulated a wealth of industry specific skills. The role of the course co-ordinator/administrator is to undertake a skill's assessment to assist in identifying an appropriate entry point for formal training to commence. The training needs analysis reveals what they know now (current performance) and what they should know or be able to do in the future (required performance).

Operating within a national competency standards framework, where the standards have been defined by industry, enables the assessment to be extremely accurate and efficient. A sample competency standard is displayed in appendix A and will be discussed in more detail as part of the workshop.

- **DESIGN - Develop a customised workplace training plan.**

At Levels II and III the focus is on foundational skills and, as such, the units are independent. A workplace based training plan integrating enterprise goals is not required, with each module being completed progressively.

At levels IV (and V), however, the training plan is constructed around the training gaps identified in the skills assessment and is prepared in partnership with the enterprise. This offers the opportunity to link training with workplace needs. The students are also required to develop their own personal goals so as to ensure ownership. As a tailored package, the outcome is an effective, meaningful and engaging training opportunity. Appendix B presents some sample Level IV case studies. The workshop will elaborate upon these and other training plans.

Support throughout the training is offered by both the training provider (South West TAFE) and the workplace, regardless of the level of study. Assessment varies according to the skills of the workplace supervisors. If appropriately skilled (an audit is taken place at the commencement of the plan), workplace assessment can take place in the workplace although in all cases, South West TAFE assumes ultimate responsibility for assessment.

The competency standards of the training package act as a benchmark for measuring performance. Because of the high visibility of the training plan, authentication of skill acquisition is easily achieved in collaboration with the workplace supervisor.

## Training Plan for Loreto Dunn

**History:** Successful completion of Certificate III in Business with some exemptions at Level IV. A variety of workplace experiences, with the current role focused on reception, employment and client liaison.

**Training Gaps:** Certificate IV in Business (administration)

*Meeting Client Needs*

- Identify current client requirements
- Provide information on current service provision and resource allocation within your area of responsibility
- Identify trends in client requirements

*Supervising Teams*

- Plan work for the team
- Allocate tasks to members of the team
- Monitor team performance
- Provide training for team members

*Using New Technology*

- Maintain current knowledge of developments in information technology
- Identify new technology to assist the enterprise to meet its goals
- Use new technology to solve problems

*Providing Information*

- Compose report/correspondence

*Supervising a Records System*

- Maintain existing filing arrangements
- Ensure distribution of files and records
- Maintain security of filing system
- Train staff in records management

**Goals**

| | | |
|---|---|---|
| Personal: | Career development | To have a formal qualification |
| | To develop advanced Internet skills | To have an objective to focus on |
| | To equip myself with up to date skills | To help fulfil future career aspirations |
| | To be challenged | To boost self-confidence and self |

| | |
|---|---|
| | esteem |
| Self Actualisation | To contribute to the workplace |

Workplace: To identify and then implement a replacement database system to manage client data.

The Supervising Teams module will underpin your training plan. It is here that you will do the planning that will be required to meet the workplace goals. The Meeting Client Needs module will be used to clarify the database requirements of your internal staff and the government agencies to which you are accountable.

As an elective unit, Using New Technology will be used to research and then develop skills in the appropriately nominated database application(s). The competencies of the Supervising a Records System and Providing Information will assist you in the successful integration of the new database system and the communication to relevant parties.

**The Outcomes of your training plan will be:**

- A formal report that identifies the business needs for a new database system and then subsequently outlines the options and recommendations to replace NIMS
- the development of training plans to support this implementation
- the development of records and information management systems that will accommodate the initial transfer of data and then the ongoing database management.

Figure 9 – Sample Training Plan

A three-way contract is signed at the commencement of the training plan ensuring the commitment of the student, the business enterprise and the training body to the achievement of these goals and competencies. Additional case studies have been included in Appendix B and will be reviewed in detail as part of the workshop.

- **IMPLEMENT - CONTRACT THE PROFESSIONAL STAFF**

Once the training plan is in place, appropriately skilled teachers are contracted to support the training plan. Because of the unique demands placed on teachers working in a flexible delivery model, a supplementary contract is signed by all parties ensuring an understanding of the expectations.

**Figure 10 – Sample Teacher Contract (extract)**

## 1.0 Duties

1.1 Attend training sessions in online delivery as scheduled.

1.2 Participate in skills assessment as required.

1.3 Maintain your electronic profile with current information.

1.4 Accessing the online environment at least once every 24 hours during the working week.

1.5 Answer queries received by electronic mail, facsimile or post within 24-48 hours of receipt.

1.6 Acknowledge the receipt of assignments within 24-48 hours of initial receipt.

1.7 To mark assignments and return them by electronic mail, facsimile or post within 6-10 working days of receipt.

1.8 To support and encourage students by initiating and maintaining regular contact through the communications options such as: e-mail, conferencing, chat and developing online learner networks within your academic area.

1.9 To maintain accurate student records and provide briefings to the training co-ordinator on individual student's progress on a regular basis.

1.10 To report to training co-ordinator the student's final result(s) upon completion and process results within 6-10 days of the module being completed.

1.11 To advise the training co-ordinator if you are unable to fulfil any of the above requirements.

By being copied on all electronic communications, the course co-ordinator/administrator is able to monitor and evaluate progress and engage additional teachers as the training plan unfolds.

## CONCLUSION

As titled, the purpose of this paper has been to highlight the fact that flexible delivery is not simple a question of technology. Rather, it is a combination of three critical features

1. The design and development of an appropriate technological infrastructure;
2. The 'value adding' to training materials to ensure that they are specific to online delivery;
3. The implementation of the model using training plans to ensure an effective and engaging training plan;

We would be foolish not to take advantage of the multiple benefits the new technologies have to offer. However, we would be remiss as educators not to ensure that the "best of the traditions of the past are maintained, adapted and preserved". Despite the rapid technological advances, technology must never be seen as a solution in its own right.

Flexible delivery is like any good recipe. It requires good quality ingredients and a good cook to make it work. Our experience at South West TAFE has shown that elaborate websites and appropriately designed learning resources are important vehicles for achieving educational outcomes. However we have learnt that when designing a flexible delivery model the order of priority must be people, processes and then technology as it is the 'people' factor that will ultimately guide the learners to success.

## REFERENCES AND SUGGESTED READINGS

- Delamont, S. (1992), *Fieldwork in Educational Settings: Methods, Pitfalls and Perspectives,* London: Falmer
- Kanter, R.M. et al, (1992), *The Challenge of Organisational Change: How Companies can Experience it and Guide it,* New York Free Press
- Laurillard, D. (1993), *Rethinking University Teaching: A Framework for Effective use of Educational Technology,* Routledge, London
- Senge, P. et al, (1994), *The Fifth Discipline: Fieldbook,* Nicholas Breasely Publishing, Ltd. London
- Wheeler, Leone (1996), *Teaching and Learning Online – A Manual for Teachers in Vocational Education,* Open Training Services

## APPENDIX A – SAMPLE COMPETENCY STANDARD

### BSATEC401A – Producing Complex Documents (60Hrs)

### SELF ASSESSMENT SECTION

| Competency Element | Performance Criteria | Initial | Date |
|---|---|---|---|
| 1 Establish document design and structure | 1.1 Requirements of the task are identified<br>1.2 Software appropriate to the task is selected<br>1.3 Document design and structure is suitable for the information provided<br>1.4 Document design and structure meets enterprise requirements | | |
| 2 Develop template or macros for document design | 2.1 Templates and macros are developed and used to ensure consistency of design and layout<br>2.2 Amendments to templates and macros are made as required | | |
| 3 Produce documents | 3.1 Data is entered and edited accurately<br>3.2 A range of advanced functions is used to ensure the accurate completion of the task within the designated timelines<br>3.3 Information from other computer files and/or printed documents is inserted as required<br>3.4 Documents are checked for spelling, grammar and numeric data<br>3.5 Documents are proofread for accuracy of contents<br>3.6 Documents are proofread for consistency of layout and style<br>3.7 Modifications are made to meet required specifications<br>3.8 Documents are presented to the nominated person/section for approval prior to completion and/or final printing where necessary<br>3.9 Documents are printed as required<br>3.10 OHS guidelines relating to screen based equipment and ergonomic workstations are observed | | |
| 4 Save file and exit system | 4.1 Document is saved and stored in appropriate directory or folder<br>4.2 File is closed and applications programmes are exited without loss of data<br>4.3 Back up copies of files are made in accordance with specified procedures if required<br>4.4 Disks/data are filed and stored in accordance with enterprise procedures | | |

## BSATEC401A – Producing Complex Documents (60Hrs)

**To be completed by trainee:**

*(Please note any tasks and/or equipment used in achieving this competency, both in paid and unpaid environments)*

| |
|---|
| |
| |
| |
| |
| |
| I have completed all the requirements of the competency, including all Occupational Health and Safety requirements.<br>Signed (Workplace Trainee):<br>Date: |

## 1 ASSESSMENT GUIDELINES AND TRAINING NEEDS

**Training for this competency:**

☐ On-the-job training only

- *Document layout is appropriate for the data*
- *Defaults are set correctly*
- *Speed and accuracy are to enterprise standards*

  *(this may be the standard in Standards Australia AS 2708-1991 Typing Speed or AS 3549-1989 Typing Accuracy)*
- *Documents are proofread and final document is correct*
- *Data is saved and backed up according to enterprise requirements*

  *NOTING:*
- *Enterprise procedures and policies, e.g. backup procedures, file maintenance*
- *Software packages used: word processing, database, spreadsheet, page layout software, graphics*
- *Advanced functions include, but are not exclusive to: templates, macros, autotext, glossaries, table of contents, index, formatting, (e.g. defining styles, importing graphs, sections, margins), scanner/colour printer*
- *Instructions, e.g. manufacture's guidelines, procedures manual, training notes*
- *Relevant legislation, e.g OHS, copyright*
- *Specialist/technical texts and vocabulary*

☐ Requires some additional material to support on-the-job training

☐ Will have to be completed off-the-job

☐ Is not required *(refer to method of assessment)*

## BSATEC401A – Producing Complex Documents (60Hrs)

### VERIFIED ASSESSMENT SECTION

| ASSESSMENT VERIFICATION | |
|---|---|
| **Method of Assessment:**<br>☐ Observation<br>☐ Demonstration<br>☐ Work Samples<br>☐ Questioning & Disscussion<br>☐ Off-the-job Assessment<br>☐ Previous training records<br>☐ Other *(Please describe)* | **Assessor Comments:**<br>**(Please comment on trainee's overall ability with this competency)** |

**We certify that the trainee is deemed competent in all elements of this competency, and that we meet the requirements as outlined in the Administration Training Package to conduct assessment.**

Workplace Supervisor/Assessor:…………………………………………………………….Date: ……………………

Training Provider Representative: …………………………………………………………..Date: ……………………

**I certify that the trainee has successfully completed all 'on-the-job' training requirements of this competency.**

Employer:………………………………………………………………………………………..Date: ……………………

## APPENDIX B – TRAINING PLAN (CASE STUDIES)

### Training Plan for Marita McInerney

**History:** Fifteen years experience in an office environment with minimal formal training.

**Training Gaps:** Certificate II

*Using Numbers in the Workplace* – using OLOSP materials

*Preparing Financial Documents* – using OLOSP materials

Certificate III No training required

Certificate IV

*Meeting Client Needs* – competencies are:

- Identify current client requirements
- Provide information on current service provision and resource allocation within your area of responsibility
- Identify trends in client requirements

*Presenting Report* - competencies are:

- Research information relevant to the issue
- Analyse information and reach solutions about the issue
- Produce an investigative document
- Deliver an oral presentation based on the written document

**GOALS**

**Personal:** To consolidate and recognise existing skill base that has been acquired through a combination of informal and formal training by completing some gaps in Certificate II and Certificate IV in Business (Administration).

**Business:** To increase her current skill base in areas as they relate to her current workplace, Marita will undertake to develop a 'Meetings Handbook' for

St John of God Hospital staff.

Using the competencies of Meeting Client Needs, Marita will research the needs of the potential users within the hospital departments. This data, along with hospital protocols and procedures will form the content of the manual.

The Presenting Reports module will enable Marita to document the process for creating the manual and maintaining it. In addition, Marita will provide training sessions for interested staff to meet the 'oral' competency associated with the presenting reports module.

**The outcomes of this training plan will:**

- The collection and analysis of data to assist in compiling the manual.
- The development of a Meetings Manual for distribution to all hospital administrative staff.
- Writing of a report detailing the development process (for future reference) and ongoing maintenance of the manual.
- The conducting of training sessions for interested staff.

**Training Plan for Natalie Manson**

**History:** Completed a 12-month secretarial training course after completing year 11. Has held a variety of administrative positions with maternity leave in 1991 and 1994. Currently working part time in a reception position at Leadtec Computing, Melbourne.

**Training Gaps:** Certificate III

*Business Correspondence* – using OLOSP materials

Certificate IV

*Meeting Client Needs* – competencies are:

- Identify current client requirements
- Provide information on current service provision and resource allocation within your area of responsibility
- Identify trends in client requirements

*Supervising Teams*

- Plan work for the team
- Allocate tasks to members of the team
- Monitor team performance
- Provide training for team members

*Presenting Report* - competencies are:

- Research information relevant to the issue
- Analyse information and reach solutions about the issue
- Produce an investigative document
- Deliver an oral presentation based on the written document

*Elective Units:* Desktop Publishing, Computer and Sales Marketing

**GOALS**

**Personal:** To consolidate and recognise existing skill base that has been acquired through a combination of informal and formal training by completing some gaps in Certificate III and Certificate IV in Business (Administration).

**Business:** To develop a direct marketing strategy for Leadtec.

To increase her current skill base in areas as they relate to her current workplace, Natalie will commence the Teams Module with the goal of working with key marketing staff to develop a direct mail marketing strategy for Leadtec. The MCN module will form the basis of the team's research supplemented by elective modules in computer sales and marketing.

All activities of the team will be documented using the competencies provided in business correspondence (level III). The Presenting Reports module, combined with elective study in desktop publishing, will underpin the written and oral presentation to management.

**The outcomes of this training plan will:**

- Development of a direct mail marketing strategy.
- Presentation of findings to the management and sales team.

**Training Plan for Janet Campbell**

**History:** Completed a Bachelor of Science. Currently working part time as the Laboratory Technician in the Nursing Dept. at Deakin University.

**Training Gaps:** Certificate IV

*Meeting Client Needs* – competencies are:

- Identify current client requirements
- Provide information on current service provision and resource allocation within your area of responsibility
- Identify trends in client requirements

*Supervising Teams*

- Plan work for the team
- Allocate tasks to members of the team
- Monitor team performance
- Provide training for team members

*Elective Units:* Web Page Design and Development

**GOALS**

**Personal:** To recognise existing skill base and extend administrative skills by completing the Certificate IV in Business (Administration).

**Business:** To develop a comprehensive equipment submission in conjunction with the three technical officers from each campus.

**The outcomes of this training plan will:**

- Development of equipment submission pending funding availability
- Development of evaluation tool to be used by undergraduate students with the outcome being the making of recommendations to convenor of the Undergraduate programme

TEND 2000

Crossroads of the New Millennium

# Teaching Technical Students To Be Critical

Prepared and Presented

By

**Dr. K.E. Shaw**

Research Fellow

School of Education

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Saturday 8 April, 2000

## Workshop 1

# Abstract

Changing conditions of competition in the global market in respect of employment and human resource accumulation, have stressed the need for revised pedagogies. Real adoption of new knowledge, particularly in science and technology, means that it must be understood in depth and be spontaneously available for use in the real world and not merely in the examination hall. Students need to have mastery of higher cognitive processes, the so-called metaskills. Central to these is a more developed awareness of their own understanding, learning strategies and mental processes. They need to be able to construct new meanings and thus understandings, independently, by restructuring experience through reflection. A pedagogy that promotes these, needs to begin early and be carried through to the end of higher education.

# Teaching Technical Students To Be Critical

Not everyone is at present willing to accept that as more and more young people enter higher education, all of them are capable of developing high level skills and understanding. Yet as the economies of advanced countries have moved first from agriculture to industry, then on to advanced technological modes of production, those who go on to higher education have risen from a very small part of the age-group to over a third. The anthropologist Musgrove (1982, pp.51-55.) argued that in Africa, for example, those who moved from the countryside to the more stimulating atmosphere of the town performed better in education than those who remained villagers. There seems to be something about being brought up and living in a quickly changing society that demands modern ways of living that help younger people pick up the new behaviours quickly. They find easy and natural some things that the older generation finds difficult and harder to learn. It may well be that as we move to an information/knowledge based society with widespread electronic communication, the younger generation will continue to be stimulated, to learn and adapt readily to new conditions. There are grounds for optimism, but higher education needs continually to review its methods of teaching.

We need to be able to build on the new capacities young people are able to develop because of their exposure to new technologies and experiences. It is not just a matter of up-dating the curriculum to new knowledge. The teaching methods and approaches need to be kept up to date as well. At the same time, we need to hold on to the great traditions, such as Islam, which hold societies together in the face of change. We need to understand the older outlooks and values as we accept some new ones. In rapidly developing societies, such as the Gulf States, some people are bound to meet discontinuities in the ways they experience life as these changes take effect. Even well educated people may have problems in making sense of what is happening in their lives as values and outlooks change. Introducing what is new is never easy or free from conflict in societies. There are no "quick fixes". New elements in the local culture are forced upon societies because they have no choice but to participate in the global economy. Large groups in the population, especially the better educated, need to be able and willing to accept a measure of uncertainty and ambiguity, yet still be able to make decisions and live with the outcomes these produce. They need to develop further the ability to manage change in a critical but positive spirit. This is especially true in the world of technology.

## HIGHER THINKING ABILITIES IN YOUNG CHILDREN

Any method of teaching which aims to promote the higher thinking skills needs to begin early. It cannot be left until students reach higher education. Gardner (1991) has suggested one reason. He points out that the natural endowments that enable infants to learn language so successfully also lead often to children picking up in their early years misunderstandings such as preconceptions, stereotypes and other misleading basic ideas about how the world is. This work has been done by studies of performance in mathematics and physics, but also in the social sciences. Many of the children's basic assumptions, though primitive, are adequate at first. Later, however, they have to be challenged by more sophisticated ideas and concepts which are more difficult and may appear at first to go against common sense. This is even more likely to happen if the later ideas are taught away from direct experience of reality, just verbally in the classroom and lecture hall. A common result is that these more adequate theories may be learned by the students well enough to get the desired certificates and diplomas. Yet there is plenty of evidence that, if these students meet problems which do not fit clearly within the standard classroom solutions they have learned, they often go back to the earlier misapprehensions. That is to say, unless the more advanced ideas and concepts which they ought to be applying have been learned with genuine understanding, so that they really replace the older and more basic ways of thinking. Otherwise, these inadequate approaches will persist in the students' minds. Even in mature people and higher education students they can cause misunderstandings, mistakes and wrong approaches to problem solving. Just how to teach the more advanced ideas, so as to bring about genuine understanding and not just surface learning, has been a matter for much argument, as we shall see.

For this reason, it is now considered important in the West to start teaching critical thinking, the ability to be very aware of one's own ways of thinking, early in school life. This has been described as setting out on the path that leads to metacognition. Fortunately some procedures for bringing about this sort of teaching are already known and can be employed in the first grades of the elementary school. An early pioneer was Lipman (1976). He realised that young children can be led to participate in work that might be expected to improve later achievement of higher mental processes, understanding and use of more advanced ideas. Borrowing techniques from philosophy, he tried to get teachers to be talented questioners of their pupils, not just transmitters of standard knowledge. He devised questions and material that would strengthen children's reasoning and judgement. He saw a role for enquiry in classrooms, taught in ways that would lead children to become aware of and correct poor solutions for themselves. He wanted quite young children to be taught to be aware of the context of problems, the circumstances in which they arose, to understand and think about criteria. They were to be asked to make judgements in groups through discussion in project work. Lipman's Philosophy for Children programme tried to get younger pupils to reflect on their own ways of thinking, to be more alert and talk about solutions to problems. He wanted them to pay attention consciously to what they learned about their own ways of thinking as these were revealed in group discussions. This kind of teaching was intended to be of lasting value, to encourage the students to question dogmatism, challenge assumptions and examine arguments rather than uncritically reproduce them for examinations and tests (Fisher, 1990/93).

In the UK and the USA, there are currently many anxieties about how well children have mastered basic language and number skills. Governments want ways of assessing children's achievement that can be used in comparisons to show how well schools and teachers are performing. These have dominated national testing. But a great deal of work has been done in the UK, for example by Pollard (1995) and by Adey and Shayer (1994), which is intended deliberately to get students even in the more junior grades to be more thoughtful about how they learn the subject matter of their schoolwork. Similar work is being carried out in the USA, particularly in Project Zero at the Harvard School of Education (Gardner 1991), and work at Vanderbilt University (The Cognition and Technology Group, 1990). All this is quite at the opposite extreme from 'blind' rote learning. It is hoped that children will become more self-aware, and thus more self-critical, learners. This is considered to be among the most important elements in learning-for-understanding, rather than mastering ritual, conventional, procedural learning and performances. These may enable students to make correct responses to expected cues and questions, for example in tests and examinations. But they do not often provide genuine and deep understanding that can be used for problem solving in the real world without further practice.

## HIGHER THINKING ABILITIES IN THE MIDDLE YEARS

As we turn to older students and begin to leave behind the basics of elementary education, we enter into controversies about skills and competencies versus general education (Bowden, 1993, 1997). In the West, the problems go back as far as Whitehead (1929) and Dewey (1933) who drew attention to the knowledge people have but cannot make use of. They can recall such knowledge if asked directly but, if they are trying to solve non-routine problems to which the knowledge would be relevant, they have difficulty in using it. Thus, it is not simply that, as they grow, students need to replace basic simple ideas with more adequate theories; real adoption of new knowledge means that it has to be understood in depth and be spontaneously available for use. To be able to do this, students need to be much more aware of, actually notice consciously, how the new information affects their knowledge stock, how the new theories extend their own understanding and thinking. They have to be encouraged to be aware of, alert to, how their own minds work when it comes to learning new ideas and solving non-routine problems. It must be emphasised that this metacognition is not a substitute for thorough, fluent and sound knowledge. The two need to develop together. These competencies need to be fostered deliberately by teaching styles and activities, which in the US are called interventions, alongside the sort of teaching that is designed to bring about retention of knowledge. The Harvard and Vanderbilt studies have tried to invent such interventions and to examine the theories that claim to justify them.

A recent study by Goodchild (1997), based on much study of classrooms, once again stresses the well-known finding that mathematics students often cannot use their knowledge of the subject imaginatively and inventively. They may even have difficulty in reproducing aspects of mathematics that have been explained and practised, unless they are prompted. This is especially so in applications of mathematics to real life situations. In his study, Goodchild, following Schonfeld (1987), draws attention to three sorts of ways in which the mind works:

- the knowledge learners have about their own ways of thinking
- learners' self-control and self regulation -- how well they can track what they are doing, and
- learners' beliefs and intuitions -- the ideas about mathematics they bring to their work.

He claims that students can be led to reflect on their experience of learning and so construct new meanings for the material they are studying. Consequently, they gain new understandings. The operations and activities they undertake in their learning produce new experiences and new insights. If these can be handled properly, significant changes can be brought about in the understandings -- the schemata --that students already have in their minds, as a result of being stimulated to reflect in an abstract way about what they are doing. Because this is needed, the ability learners have to observe and think consciously and critically about the thinking they are engaged in needs to be deliberately developed. Often when this is not done, teachers have plenty of opportunities to observe "blind" learning taking place amongst the students. They are simply following procedural steps without conscious realisation of where they are headed. In ordinary teaching in the classroom, this sort of activity amongst the students may even produce the right answer in the test. However, the students are leaving classes with little genuine insight or understanding and what they have remembered may not be available to them for solving practical problems outside academic situations. Yet they may be able to recite the procedures, the formulae and so on confidently and fluently provided they receive the cues and questions they have come to expect.

When this sort of less productive learning is taking place, then, students are regularly engaged in accomplishing tasks which satisfy the teacher and appear productive whilst, in act, they are doing little more than blindly practising set procedures. Such students are not "doing mathematics", or "doing physics": they are "doing college". Such knowledge as they gain is restricted very largely to the predictable classroom situations, but it is not fully available to be taken across the school or college doorstep to be used confidently in the world outside. There is a long tradition in the philosophy of mind in the West that claims that the world cannot be known directly. Only organised experience can be known. If we accept this, learning is a process of continuously adapting our ideas and understandings by restructuring and reformulating the experiences we have in the lecture hall and elsewhere. We have to do something actively with what is transmitted to us by teachers. As Underhill (1991b) puts it, reflection by the learners "is the main factor which stimulates cognitive restructuring."

Students who engage in these forms of reflective abstraction whilst they are learning are being self-aware, keeping conscious track of what they are doing. They are trying to make themselves aware of the ideas about mathematics (or whatever other subject) they have brought to their work. They are constructing new meanings for themselves by metacognition. Metaskills include:

- Judgement, in particular, the ability to see a particular case or situation as part of a greater whole and to decide which amongst several possible approaches to the problem may be relevant.
- Awareness developed and cultivated understanding of the relevance of the knowledge, skills and experience a student already has, that may apply to the problem, and of the limits of their competencies. In particular, self-awareness, that is, an alert readiness to get involved in learning and problem solving activities and, at the same time, to monitor one's own performances, reactions and responses, so as to make more appropriate moves.
- Analysis and synthesis, that is, the ability to put experience into appropriate mental categories that are meaningful; also to see or impose a pattern on experience and apply these new insights in different situations and problems so as to gain some degree of control and understanding.

All these rely heavily on confidence that students get by experience and practice of the approaches we have been examining. It has, of course, to be recognised that heavy curricular demands rarely allow students much time to achieve such practice. The cost of that is a lot of "blind" learning that is often not fully understood until much later, if at all.

## TYPE TWO LEARNING AND SITUATED COGNITION

At the Technological Education and National Development Conference held in Abu Dhabi in 1997, Bowden argued for higher technical education to aim for outcomes based on competencies students had achieved and could demonstrate, rather than the kind of general development of mind and self-insight that we have advocated here. Bowden's approach helps to remind us that over the past 20 years or so, views in the West about cognitive psychology have developed in at least two different directions. The first I have been discussing in this paper. It is concerned with learning as a path towards understanding, higher processes of thinking, metaskills concerned with gaining insight and mental awareness, in contrast to "blind" memorising and the practice of routine skills and procedures.

The second is "situated cognition" nearer to what Bowden wants. This is the view that good learning is very much a matter of social groups. It draws on the culture of people actually working in the field, so that learners are put in a position rather like apprentices. Bowden, and to an extent the Harvard University Teaching for Understanding project see understanding as demonstrated by something to be performed, as the ability to demonstrate a competence, or, as Perkins and Blythe (1994) put it, "giving an understanding performance".

This is a thoughtful performance in which the learner attends consciously to the attempt rather than merely executing skilled motor activity in a routine way. On this view, learning must mean that the student is engaged in activities (Gardner, 1991; Lave and Wenger, 1991) where they are required to generalise, find new examples and carry out applications of the material studied. The stress is put on the way the students develop an awareness of criteria, and on feedback to them which is evaluative and formative, that is, offered as the work progresses to aid in its achievement. It is intended that there will be opportunities for reflection as learners confront carefully chosen topics which are central to the discipline being studied. They are selected to be within the learners' experiences, as well as connected to real life and to each other. Learners have goals of "understanding that....", "appreciating that....". The course needs to include a variety of such understanding performances increasing in subtlety as the work progresses, with supportive formative feedback rather than tests.

Both these pictures of the learning process contrast with "thinking as usual" (Quick, 1994). Characteristic of the more sophisticated learning approach described above are thinking strategies of which learners are consciously aware and are drawn from a varied stock present in their minds. They are not just filling pages dutifully. When students can show that their understandings are explicit and critical, it is valued.

There is an unsettled disagreement between supporters of these two approaches in mathematics. It has been claimed that what some professionals working in the field of mathematics do, is abstract, "in the mind". Any insights and awareness are, therefore, private to the practitioner, not necessarily "situated" nor in a social context. In addition, if the object of the teaching is to bring the students to higher order capacities of the mind, and not specific vocationally related ones, Bowden's position has less to offer. All the same, it cannot be overlooked that any such attempt to modify current teaching and learning approaches has serious implications for the curriculum content as regards breadth rather than depth.

In the world of the next century, higher technical education may be willing to extend its vision beyond the production of "disciplinary experts" in specific areas such as engineering, mathematics and physics. For employment in the global market, there is likely to be a need for students to have some recognition that they must become "symbolic analysts". The sort of extended knowledge and skills they will require will include those which can be observed in think-tanks, consultancies, novel organisational settings, often with international personnel. They will have a concern for creativity by people able to work well in groups and alert to a dynamic market for knowledge-based products. Describing this sort of knowledge, Gibbons (1994) stressed that it is created when the need arises, not bought "off the shelf" but invented in response to the huge new demands of the "knowledge society" of the future. High quality human capital, that is, appropriately educated and job-socialised people, are the key resource for finding, producing and applying this knowledge in the world market.

The stream of writing that we have been considering, which insists on learning for understanding and on high quality thinking, runs into the difficulty that much learning in the classroom and lecture hall is distant from everyday reality and away from of any familiar context for the learners. Such academic knowledge runs the risk of producing a cognitive elite who function with difficulty in the world of work. Knowledge valued in this real world, which Gibbons calls "type two" knowledge, as opposed to type one which is conventional subject disciplines, is usually very strongly related to the immediate context and is judged by how it is used. It is developed on the job in the face of the problem. It is carried by experts who can see beyond their original degree discipline and are willing to borrow, hybridise and consider different perspectives side by side. As students in Higher Colleges of Technology move beyond first degree studies, they will, in many cases, soon encounter issues of policy and of management. These are related to society as much as to their degree subject and for which the stage of more advanced studies needs to prepare them.

The whole task cannot be achieved entirely by schools and higher education. Tishman et al. (1993) adds to this point the suggestion that skills and higher mental abilities are not the whole story. Learners also need a set of dispositions, an inclination, a settled system of beliefs and values, to be able to operate happily in these settings and with this style. Such traits may well be implanted and fostered in the home. They may well relate to the manner of parenting and thus they are to some extent a cultural issue. There are ways of being brought up to see the world which favour adventure, planning, breadth, curiosity, self-awareness, interest in how and why questions and in decision-making, A disposition is a sort of commitment to principles and conduct. It is not normally fostered by heavily transmissive teaching methods, which may inculcate the rule but not the spontaneous disposition to apply it thoughtfully. Hence, as well as teaching, higher education institutions need to take pains to draw students into a culture in the institution, a climate and relationships, which encourage all members to question, to seek explanations, probe assumptions, give reasons and examples and interactions. It is not simply a matter of receiving direct instruction. This is rather a tall order. As the Higher Colleges of Technology are able to move from a teaching to a teaching-and-research function, promoting such a climate within them should become easier.

Over the last 20 or 30 years, then, the work I have been discussing, which relates largely but not entirely to mathematics, science and technology, has strengthened the view that when structures and curricula are securely in place and working in the Higher Colleges of Technology, they should turn more attention to how they teach. Colleges might try to develop and implement more sophisticated styles of pedagogy. This is especially needed because of the demands of the coming global market for symbolic analysts rather than disciplinary specialists. In addition to problem solving and finding new applications, the needs of the market demand that the same technologies and skills must be constantly developed and repatterned to meet the ever new call for wider product ranges. The world economy will increase the opportunities for problem identifiers. Such people can act as brokers amongst those interested in the new technologies, and are specialists in communications with the ability to interpret new ideas. All such personnel will be able to go beyond conventional research and development into the world of policy and politics. They will be able to work on problems of how knowledge works as an economic resource. The

Higher Technical Colleges are well positioned to introduce students to "type two" knowledge, close to the market, if they are willing to work towards a modified institutional culture and revised pedagogy. This might involve flexible project teams, transient research clusters, arrangements for acting as brokers to exchange knowledge amongst different interested parties and rapid response to technological change. Such an outlook and practice would understand that a developing research culture was something more than just an elite activity for postgraduates still built on the conventional subject areas.

To sum up: higher technical, or indeed any kind of higher education, cannot be content for much longer with teaching aims and cultural styles which see their chief purpose as turning out young people qualified with their degree certificates. Changes in the global and local job market are bound to continue. Nobody can now say in advance what the graduates and post-graduates of the future will need in the way of information and skills. But it is possible to foresee the need for modified attitudes to knowledge. In particular, these will involve students in real world problems involving symbolic and conceptual analysis at a high level and in a wide range of contexts. As we in the West have become more familiar with higher education as it was carried out in the former socialist countries, we have seen how institutions can lose flexibility. They retain for too long styles of teaching and curricula, which are heavy with conventional and traditional approaches and material. These can certainly give students well-furnished minds and advanced skills. However, it is questionable whether such people are nimble enough in many cases for the faster moving conditions to which East European societies are now exposed, economically, culturally and technologically. This lack of the ability to up-date themselves to modern conditions fast enough is a long recognised difficulty for centrally controlled institutions, especially where they exist in autocratic cultures. The normal responses have been to call for improvements in the structures and the curricula of such institutions, as the TEND 97 Conference well showed.

The intention of this paper has been to argue that, whilst these two are necessary, they are not enough. There is a third element of equal importance. It is to move to a more up-to-date approach to teaching and a modernised, opened-up culture within the institutions. Approaches and methods of teaching and learning, in classrooms, lecture halls, laboratories, workshops and computer workstations tend to be matters for private individual decision. They are less likely to be debated in public than matters of structure and curriculum.

Revisions in the way people teach and learn tend to depend on insights and experiences which are shared within the teaching staff. They are often derived from research sources much less well known to the public and to administrators than structures and curricula. They can be developed and spread within the individual institution if its is run in an open way. It certainly helps if there are other necessary changes taking place at the same time, so that there is a general atmosphere of change and renewal going on. On a worldwide scale, the rapid appearance of mass rather than elite higher education has loosened up institutions in many countries. This is rather like the last big change in higher education when the university, which had seen itself as the House of Intellect, steadily came to take on the role of the School for (professional and technical) Skills. We are still digesting this major change. In a rapidly moving world, each major change in any institution is not final; it is just a rehearsal for the next. And each of these major changes has to be managed in such a way that the great traditions of the individual states which the institutions serve are fully taken into account and also change a little as a result.

## REFERENCES

- Adey, P. and Shayer, M., (1994). *Really Raising Standards,* London: Routledge
- Bowden J.A. and Masters, G.N., (1993). *Implications for Higher Education of a Competency based Approach to Education and Training.* AGPS:Canberra, Aus.
- Bowden J.A., (1997). "Competency Based Education: Neither a Panacea nor a Pariah", *Proceedings of Technological Education and National Development 97 Conference*, Abu Dhabi.
- Dewey, J, (1933). *How We Think,* 2nd Edn. Boston Mass.:D.C.Heath.
- Gardner, H., (1991). *The Unschooled Mind,* London:Fontana
- Goodchild, S., (1997). "An exploratory study of year ten students goals in the mathematics classroom", *Unpublished PhD,* University of Exeter.
- Fisher, R., (1990/93). *Teaching Children To Think,* Hemel Hempstead: Simon and Schuster Educational.
- Gibbons, M., (1994). *The New Production of Knowledge,* London: Sage.

- Lave, I and Wenger, E., (1991). *Situated Learning*, Cambs: CUP
- Musgrove, F., (1982). *Education and Anthropology*, Chichester: John Wiley and Sons.
- Perkins, D and Blythe, T., (1994). "Putting understanding up front", *Educational Leadership*, Feb., pp.4-7.
- Pollard, A. and Filer, A., (1995). *The Social World of Children's Learning*, London: Cassell.
- Quick, J, (1994). *Pupil culture Curriculum Studies* 2, 1. pp.99-117.
- "1996 Learning and context." *British Journal of the Sociology of Education*, 17, 1 pp.103/113
- Schonfeld, A.H. (ed.), (1987). *Cognitive Science and Mathematics Education*
- Tishman, S. et al., (1993). "Teaching thinking dispositions", *Theory into Practice* 32. pp.147-153.
- Underhill, R.G., (1991). "Learning to teach: the programme director's response", *Journal of Education for Teaching* 17, 1. Pp.73-79.
- Whitehead A.N., (1962). *The Aims of Education*, 3rd edition, originally 1929, London:Benn

TEND 2000

## Crossroads of the New Millennium

# A Successful Engineering Design Education Program Incorporating "Hands-On" And Interaction With Industry

Prepared and Presented

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Workshop 1

# Abstract

The Department of Mechanical Engineering at the University of Minnesota has developed a new engineering design curriculum to meet the pedagogical needs of undergraduate and graduate engineering students and to excite and retain engineering students of both genders and from all backgrounds. The programme is based upon a series of successful, guided, hands-on design experiences and significant collaboration with industry. The cornerstone of the undergraduate programme is a new introduction to engineering course that teaches through product dissections and creative, hands-on design activities. At the graduate level, product development projects are undertaken by teams of business and engineering students in collaboration with sponsoring companies. The resulting level of interaction between the university and industry benefits students, faculty and companies. These initiatives demonstrate that it is possible to have students of all levels experience real-world, hands-on design without requiring significant university resources. Co-operation with local industry ensures that business and university can work together to optimise the value of the educational experience for the engineering student.

# A Successful Engineering Design Education Program Incorporating "Hands-On" And Interaction With Industry

## INTRODUCTION

Engineering design education is at a crossroads with significant programmemematic changes occurring in schools throughout the world. The history of engineering education reveals a pendular motion as theories of the best way to educate engineers evolve. Prior to the Second World War, education was synonymous with practical training, with students learning to run machinery and solve problems through extensive hands-on experiences in the laboratory. In the United States this changed suddenly in the Cold War era when the Soviet Union launched Sputnik, the first successful orbiting spacecraft. Education leaders realised that future success for the country depended on graduating engineers skilled in the engineering sciences. The steam engine laboratories and shops disappeared, replaced by courses relying on advanced mathematics and physical principles. The fields of information theory, thermodynamics and chemical kinetics fueled the advances in radar, communications, rocketry and aerodynamics that marked the 1950s through the 1970s. The pendulum had swung completely away from hands-on.

Since the late 1980s, there has been a growing realisation that the pendulum had traveled too far. Universities were graduating engineers highly skilled in mathematics and engineering sciences, but weak in problem solving skills and lacking in design experience. The debate was fueled by the perception that methods of teaching design that may have worked in the past were no longer appropriate for the current era of intense global competition, pressure to be first to market and increased emphasis on quality that dictates the success of modern products. Industry also became increasingly uncomfortable with how designers were being educated. Industrial leaders called for a broadening of the scope of education rather than additional training in specific technical skills. The new product design leader must not only be technically competent, but must also be able to define the needs of the customer, assimilate and manage the flow of information associated with a project, work in or manage a large team with members from many departments across the company, and produce results under the tight deadline of a rapid product design cycle.

The solution has been a gradual return swing of the pendulum with engineering schools recognising that students need a mix of engineering sciences coupled with hands-on design experiences to truly appreciate when the equations work and when equations get in the way.

In the United States, the result has been the creation of exciting engineering education programmes designed to excite, motivate and retain students while providing a very realistic engineering experience within the guided, education structure.

In this paper, we examine how such a programme was created and implemented in the Department of Mechanical Engineering at the University of Minnesota in Minneapolis, Minnesota, USA. The University of Minnesota is one of several large, public land-grant universities in the United States. It is the flagship school for the state of Minnesota with 246 degree-granting departments and 46,000 students. The engineering school has approximately 4,000 students of which 800 are enrolled in mechanical engineering, 500 undergraduates and 300 at the graduate level. The University of Minnesota has been consistently rated as having one of the top 10 mechanical engineering departments in the United States. The department offers a full complement of basic and advanced courses in topics ranging from fluid mechanics to kinematics to combustion to robotics.

Prior to the new programme, there were very few hands-on design experiences for undergraduates and none at the graduate level. Further, there was little interaction with industry, despite the rich, high-technology industrial base in the Twin Cities of Minneapolis and St. Paul. The objective of the new programme was to correct these shortcomings and demonstrate that a hands-on approach, coupled with significant industrial collaboration could result in a much stronger educational experience for the student with a positive benefit to the Twin Cities region and the state of Minnesota.

## INTRODUCTION TO ENGINEERING COURSE

The goal of this course was to change the way in which design was taught at the University of Minnesota, and thus serve as a model for design education at any large, public university. In particular, the faculty was interested in returning a hands-on design component to engineering education and having design be a unifying theme throughout the student's undergraduate programme.

A particular objective of this curricular project was to demonstrate that hands-on projects could be realised in large courses. There is a widespread perception that core undergraduate engineering courses with large numbers of students are incompatible with design and build projects because too much supervision and extensive shop and construction facilities are required and significant cost are incurred. The six arguments heard most commonly among faculty and administrators when the term "hands-on" is mentioned are: (1) It costs too much;

(2) Our classes are too big to consider any projects which require fabrication; (3) Our machine shops cannot handle the number of students; (4) We don't have enough faculty to staff these activities; (5) Nobody knows how to teach this kind of course; (6) It is impossible or difficult to evaluate design projects which means we can't give students grades. In reality, creating and running a course based on hands-on projects need be no more resource nor staff intensive than a course based on traditional problem sets. And, what a student learns or doesn't learn is reflected just as much in a design and the documentation associated with a design as it is in a problem set. Thus, one of the project goals was to demonstrate that hands-on activities could indeed take place in large, undergraduate engineering courses.

## COURSE DESCRIPTION

"Introduction to Engineering" is our new, required, sophomore level design course. The course was built on a foundation of dissection and hands-on design projects designed to teach fundamental principles of mechanical engineering and specific engineering skills. With just over 200 students, it is the largest course in the Department of Mechanical Engineering and as a consequence, provides an example of implementing a hands-on design course for large number of students while making use of minimal university resources and maximising cost efficiency.

A variety of methods were used to keep reasonable limits on teaching staff time while still delivering a hands-on course:

1. Tutorial information was developed and made available on the Web. This is particularly important for a course where basic skills are taught (from Excel to soldering irons), but where students enter with a wide range of backgrounds.
2. Peer evaluation of drawings, designs and projects. Several methods were used including having students exchange their drawing or essay with their neighbour and writing a quick critique on a Post-It note. Another method was to have 10 students come to the front of the class, project their drawing or design on an overhead and have another student critique the work in front of the class. This latter method not only lets the entire class understand how a critique should be done, but also gives those presenting practice in thinking on their feet and speaking informally to a large group of peers.
3. Take home tool-kits (described below).
4. Web-based course administrative procedures. For example, students could access their grades on the Web using a password system for privacy.

As an example of the type of hands-on project that can be done using minimal course resources, early in the course, students formed into teams of four and were given a "Tip-A-Can" assignment. (A project which originated at the University of Rochester.) The task was to make a can tip over, but sometime after students set it upright on a table at the front of the lecture hall and return to their seats, but before the end of lecture. It must also tip without anyone touching the can. One generally sees a wide range of innovative and not-so-innovative solutions to this problem. Most cans were designed using found materials and fabricated at home without needing a shop.

Another quick and inexpensive hands-on project is to have teams of four students construct towers from 100 index cards using only staples for assembly. This project is assigned the first day of class and is due at the second class. It immediately forces students to think about designing to a deadline and to experience working in a team of people whom they most likely do not know but have to get along with sufficiently well to complete the assignment in a hurry.

At the end of the course, students tackle a complex, hands-on design project. They have five weeks to design, construct and test their own microprocessor-controlled robot. The project charge is to "design and construct an autonomous machine that does something interesting for 45 seconds". A few simple rules constrain this open-ended goal. The machine must: (1) fit on a 30 inch by 36 inch base, (2) have at least one moving part, (3) be microprocessor controlled, (4) cost no more than $25 over the components provided, and (5) be safe. Students receive a BASIC Stamp microcontroller board (Parallax Inc., Rocklin CA), three DC motors, a NiCd battery pack and a small assortment of electronic components. The assignment culminates in a public, well-advertised Robot Show where last year 190 working machines filled one of the University's largest meeting spaces, and students had a chance to show off their work to a jury of faculty and representatives from local industry. Events such as these can boost a student's confidence in their ability to create and provides a window into the excitement of engineering. Many students comment that the robot show was one of the best times in their educational lives and that it committed them to engineering. The show is excellent publicity for not only engineering, but also for the university as a whole, and has been featured in several university public relations publications.

Engineering communication in written, oral and visual forms is an important component of the course. One important goal is to have students become comfortable with a variety of visual communication forms ranging from quick "napkin" sketches to semi-formal perspective drawings to formal CAD representations of designs. As engineers, students will use all these forms of visual communication, and, as engineers, they will be expected to be comfortable in all forms. In the course, students learn how to create quick perspective sketches as well as Pro/ENGINEER, a popular professional CAD package.

The course has modest instruction and assignments in oral and written communication forms. Each student delivers a five minute oral presentation with overhead slides on an engineering topic of his or her choice. It is the first presentation for most students, but by doing it in a relatively friendly, low-stress atmosphere, fear is reduced. Several formal and informal writing assignments related to the design projects are also given, including e-mail and print forms. Having students write about their designs is an important part of the design learning process.

Throughout the course, the concept of "professional practice" is stressed in the context of assignment deliverables. For example, e-mails with spelling or typographical errors are rejected immediately to reinforce the message that for electronic communication, a different style is required when communicating with a supervisor than when communicating with friends. For the few assignments similar to traditional engineering problem sets, standards were set for presentation and appearance. Hastily executed, hand-written documents were not accepted. By the end of the course, professional appearance and professional practice come naturally to most students.

## DISTRIBUTED SHOPS

The load on department fabrication shops and laboratories was minimised through the concept of distributed shops. Activities that traditionally have taken place in central university facilities can just as easily take place in the home, apartment or dormitory room. The robot project was served as a suitable test of the concept. The project could not have been done with 200 students if the students had to construct their machines in the department student shop and programme their microprocessor in the engineering school computer lab. Our solution was to structure the project so that students could succeed using simple construction and code development methods, and then to provide each student with the appropriate tools so that they could develop their robot at home, in much the same manner that they would work on a problem set. Thus the choice of the BASIC Stamp for the control computer because it is simple to understand, simple to programme and can connect to any PC for creating and downloading code.

Each student is provided with the "Introduction to Engineering Equipment Kit" for the duration of the course. The kit is valued at approximately USD 250 and contains a digital voltmeter, an electric power drill, dial calipers for precision measurement, a wire-wrap tool for constructing electronic circuits, several hand tools, the BASIC Stamp microprocessor and software development system, two DC motors and a rechargeable battery. With the kit, students could take apart products and create designs wherever they wished. In addition to the kit, students had the option of purchasing a set of basic hand tools for approximately USD 120, much the same way as they might purchase a required textbook. By providing this resource, projects could now be assigned which assumed access to hand tools, and no student could use the excuse that they didn't have the tools or that the student shop was too crowded. Another advantage of providing and encouraging the use of hand tools is that they are safer than most of the machine tools found in the shop, an important consideration when the majority of our beginning students are novices in the operation of tools. There are financial and logistical challenges associated with purchasing, distributing and maintaining 250 equipment kits, but these can be met with careful planning.

All of the strategies described above were part of the overall mission of lowering the barriers to hands-on design. If it is exceptionally difficult for a student to build, hands-on projects are doomed to failure. By providing easy access to tools, components, and instructions, students can and will spend more time on useful design activities rather than waiting in line for a drill press in the shop. Students really did use their tools to fabricate designs at home which otherwise would not have been possible to construct, and students appreciated the ability to construct at home on their own schedule rather than having to rely on the shop with its limited hours.

## Lessons Learned

This project demonstrated that it is possible to create a course which emphasises hands-on activities and to do it in a relatively cost and resource efficient manner. Some of the lessons learned along the way are covered in the sections above. In addition, the following are presented for consideration:

- There will always be resistance by some faculty to hands-on activities. Some criticism is warranted. If the fabrication experience dominates the student's education, students can easily immerse themselves in building their design at the expense of gaining an understanding of what they are doing. It is important that a balance be established between completing the project and becoming familiar with the tools and process that underlie successful design practice. One way of doing this is to tie analysis and design together in meaningful ways so that students realise designs they have first analysed. We are still working on ways to achieve this ideal.

- Successful hands-on activities can be excellent publicity for the department and university. Our robot project has received extensive press coverage inside and outside the university and has been used by officials to publicise university activities. Although promoting this sort of publicity may be treated with disdain by faculty, in fact it can generate support and protection for hands-on activities. When the president of a university cites your programme as an example of what is exciting in the university, you know that engineering will continue to receive strong support from central administrators.
- Extensive use of the Web as a design information database works. Design necessarily entails information gathering on the part of the designer. To make this easier for novice student designers, gather information, both externally and internally generated, organise it in some reasonable fashion and place it on the Web. Although the time to create and maintain such a database is substantial, it ultimately will save time in student interactions since students will now have easy access to information which they ordinarily would require instructor time to obtain. Plus, today's students expect information to be on the Web and are extremely adept at finding and using it.
- It takes time, energy and dedication to create new courses, even more so if those programmes involve hands-on activities. The rewards come from the bright, energetic students who become excited and motivated by design.

## NEW PRODUCT DESIGN AND BUSINESS DEVELOPMENT PROGRAMME

At the graduate level, the University of Minnesota has launched an initiative that creates a novel educational model for teaching the principles of product design and development. The goals of this effort are:

1. To train future leaders of product design and business venture teams.
2. To improve the process of product design and business development through the understanding and development of new product design methodologies and entrepreneurial strategies.
3. To design new products and business opportunities for sponsoring companies.

The programme represents a new partnership between the University and industry to advance the state of product design and business development. This section of the paper describes the programme, discusses essential issues for university-industry collaboration, and provides examples of projects undertaken.

## PROGRAMME DESCRIPTION

New Product Design and Business Development is a graduate level course offered jointly in the Carlson School of Management, the Institute of Technology, and the Department of Biomedical Engineering at the University of Minnesota. The course brings together students, faculty and representatives from client business firms to design and develop new products and business plans. Teams of six to ten students, half second year MBAs and half graduate level engineers, work together for the entire academic year (September to May) to develop a product and business concept. By May, each team is expected to deliver a working physical prototype of the product and an extensive business plan that details production, marketing and financial considerations for the product. Between four and six projects are undertaken each year.

The coaches for the teams include faculty from marketing, operations and entrepreneurial studies within the Carlson School, and from mechanical, electrical and biomedical engineering within the Institute of Technology. Executives, managers and technical personnel from the sponsoring company provide additional coaching. The coaches provide instruction in business creation, product design and product development, and have overall responsibility for seeing that the team sets appropriate, realistic goals and proceeds towards them on a timely schedule.

The project undertaken by the team is selected carefully by the company in consultation with the course faculty to provide an appropriate educational experience for the students, to provide benefit to the company and to ensure the maximum chance for success. The general area of the product should be known, but specific product requirements should not be dictated to enable full exploration of market opportunities by the product development team. The project should have significant marketing challenges associated with it - in contrast to minor product line extensions - because student and faculty skilled in marketing are part of the team. The project should have significant engineering content - in contrast to clothing, books or paper clips - because skilled student and faculty engineers are part of the team. Mechanical, electronic or electromechanical products, including those with embedded computers, are particularly good choices as are non-implantable medical devices given the expertise in medical device design at the University of Minnesota and the concentration of medical device companies in the Twin Cities area. Often, the best choice is a novel product which the sponsor would like to see developed but is in an area in which the sponsor does not have existing expertise, or is one for which there are insufficient resources to develop the product completely in-house.

Because the design teams work on real projects, issues of confidentiality and intellectual property must be settled well before the projects begin. A standard agreement form was created. Highlights of the agreement are that patent rights are assigned to the company, and that confidentiality is maintained. Assignment of patent rights to the company is essential if the team is to undertake real projects. The confidentiality and intellectual property agreement with each company is signed by all students and faculty in the course, not just those on the project. This facilitates team interaction and enables the faculty and students to generalise what is being learned from each project. We have found sharing information to be one of the best methods for learning about and improving the product development process, and the company has the benefit of many more students and faculty thinking about their product.

Sponsoring companies pay a project fee of USD 25,000 to partially offset the instructional costs associated with the course. Independent firms with total revenues of less than USD one million per year pay a reduced fee of USD 10,000. In addition to the project fee, the design team incurs project costs to conduct marketing surveys, hold focus groups, construct prototypes and produce reports. Each team is also provided with a small discretionary fund out of the course budget to cover expenses that are course, but not project related, or for small purchases that are needed immediately and would take too long to clear company purchasing channels.

The deliverables at the end of the nine months include one or more working prototypes, a detailed engineering report and a comprehensive business plan. Although the students are expected to perform at a level that will result in substantial benefit to the company, no guarantees can be made, and the company must have reasonable expectations about outcome. It is important to realise the main purpose of the course is to provide an appropriate educational experience to the student rather than a direct service to the company.

## PROGRAMME FEATURES

There are several features of the programme which make it somewhat unusual and help contribute to its success. One of the most important is that the projects are real. Projects are taken on only if the company has committed to manufacture the future product. This should be contrasted with our undergraduate design course that also runs industry sponsored projects, but typically the company does not as closely watch the results of those projects.

The mix of engineering and business students is a major highlight. Projects are run with true cross-functional teams and the engineers are encouraged to take on marketing tasks and vice-versa. As faculty, we are rewarded when we see a business student sketching ideas in a brainstorming session or making a part on the lathe in the Mechanical Engineering student shop, or to see an engineering student conduct a customer interview or run some profit forecasts on a financial spreadsheet. We do not expect engineers to become expert marketers or marking students to become engineers, but for success in product development, each team must learn from the other.

The interaction with the company is substantial. Two or more company representatives from marketing and/or engineering attend the weekly team meetings held on campus. Companies have spent thousands of dollars fabricating prototypes or supporting professionally moderated focus groups, all part of normal product development costs. In many projects, students spend considerable time at the company, particularly in the final weeks. Towards the end, as the project is gradually handed off to the company, more and more work is done by company staff working alongside the students. Final presentations held at the company site have drawn up to 20 company representatives, including CEOs and VPs. This is convincing evidence that the company cares about the result of the project.

The confidentiality and intellectual property agreement is the key that enables the university to participate in real projects with companies. Settling on a form for the agreement required substantial negotiations between lawyers for the companies and those for the university. Universities have no hold over student work done for courses, but it is unusual for the university to allow a contract where faculty assign their rights to a company since faculty are employees of the university. Nevertheless, all parties agreed that this was necessary to enable a substantial learning experience for the students.

The revenue from company participation fees supports some of the instructional costs of the programme, which admittedly is faculty intensive. The remainder of the fees has been used to support and augment the design infrastructure. For example, we paid for part of a rapid prototyping machine and purchased a number of equipment kits for the undergraduate introduction to engineering course from programme revenues.

## PROJECTS

New Product Design and Business Development started in the 1994-1995 school year. By the end of 98-99 we had completed 25 projects, and over 150 graduate students from business and engineering have participated along with eight faculty. We have worked with small startup companies such as Soil Sensors which has five employees and makes a soil moisture sensor for precision farming, and with companies as large as 3M with thousands of employees. Products have ranged from a smart clutch-brake system for Horton Manufacturing to a controlled-motion electronic integrated circuit testing machine for Aetrium Inc. to a micro-endoscope for Micro-Medical Devices. Several patents resulting from project inventions are being filed and many working prototypes have been developed.

In 1997-98, the 3M Post-it Flag group approached the university to work on a project. The challenge was to find new, innovative products for Flags that could increase sales, possibly by opening new markets. The team of students, faculty and 3M representatives generated approximately 200 concept ideas at the level of index card sketches, built about 40 prototypes and narrowed selections down to four or five final ideas realised in refined prototypes. Along the way, voice-of-the-customer information was gathered through dozens of one-on-one interviews and four professionally moderated focus groups. Sales forecasts were sufficiently encouraging that 3M will soon go forward with a placement study now that the project has been fully handed over to the 3M team.

In another project, a team working with Augustine Medical, a medium size medical device company specialising in products that keep patients warm during surgery, examined new markets for the company's core technology. That new market was identified and clearly defined in the final business plan, and several prototypes built and trial tested in the field. Augustine Medical officials stated that working with the team saved them 1-1/2 years in the product development cycle.

Another recent project was conducted with Sulzer Medica, a Swiss Company that is the leading European manufacturer of joint implants. The project entailed developing a new product to facilitate hip surgery. Having a sponsor several thousand miles distant highlighted the advantages and disadvantages of e-mail, fax, phone and video-conferencing communication media, all of which were used. To further complicate matters, the product is intended to be introduced in Europe first, but it was difficult to gather voice-of-the-customer data from European orthopedic surgeons because of the distance. Nevertheless, the team took some risks and developed a working prototype that Sulzer will take on to manufacture, and a detailed business plan covering the product introduction in both European and American markets.

**Lessons Learned**

New Product Design and Business Development has been successful in all three of its objectives. First, business and engineering product development leaders have been trained because students experience the full product development cycle in a realistic setting. Many of our graduates have gone on to product development positions in companies. Second, research results are just starting to be generated from the product development process studies conducted in parallel with the projects. Third, companies are benefiting from the creation of real product prototypes and real business plans.

Along the way, we learned several lessons that might be of interest for those considering similar programmes:

- Engineering and business must lead the programme equally. Ours is not a programme out of the engineering school with a business component added, nor a programme out of the business school with some engineering added, but rather is led by both schools. This has two advantages. First, a total development process can be followed, rather than just marketing or just engineering. Second, faculty and students can learn from their new colleagues who are nominally in different areas, but who can find common ground in new product development process.
- Creating appropriate confidentiality and intellectual property policies and agreements takes time and requires considerable negotiation between company and university lawyers. Faculty and company product managers must stay in the loop to make sure the final agreement makes good sense. Once an agreement has been reached with one company, use it for all companies since multiple agreement forms or allowing companies to modify agreements just leads to endless rounds of negotiations.
- The formal academic component of the course should centre on learning a product development process. This is what differentiates the course from a work-study programme or company internship that does not require formal academics. Through targeted lectures and readings, we advocate a total development process, from needs identification through product launch and beyond. By absorbing the didactic instruction and by observing all teams working, students can generalise beyond their own specific projects to deepen their understanding of product development process.
- The closer geographically the company is to the university, the greater will be the company interaction. We have worked with many companies in the Twin Cities area and most participate fully. Projects whose sponsors are in different parts of the country or in

different countries tend to evolve into an "over-the-wall" format where the company hears about results at a final presentation rather than being a part of the team during the development process.

## REFERNCES

- www.me.umn.edu - The Department of Mechanical Engineering at the University of Minnesota
- www.me.umn.edu/courses/me2011 - The Introduction to Engineering course
- www.npdbd.umn.eduThe New Product Design and Business Development Programme

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Crossroads of the New Millennium

# A Framework for Open, Flexible and Distributed Learning

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## Workshop 1

# Abstract

Designing open, flexible distance learning systems on the Web requires thoughtful analysis and investigation, combined with an understanding of both the Web's attributes and resources and the ways in which instructional design principles can be applied to tap the Web's potential. Designing Web-based courses for flexible, open, and distributed learning environment is new to many of us. A Framework for open, flexible and distributed learning is introduced here to provide guidance in designing, developing, implementing, and evaluating instructional and training materials on the Web. Numerous factors help to create a meaningful learning environment, and many of these factors are systemically interrelated and interdependent. A systemic understanding of these factors can help designers create meaningful distributed learning environments. The proposed framework is developed by clustering these factors into eight dimensions: pedagogical, technological, interface design, online support, management, resource support, ethical and institutional. Each dimension has several sub-dimensions, each consisting of items focused on a specific aspect of a Web-based learning environment.

# A Framework for Open, Flexible and Distributed Learning

## INTRODUCTION

To stay viable in this global competitive market, providers of education and training must develop efficient and effective advanced distributed learning (ADL) systems to meet the society's needs. Therefore, there is a tremendous demand *for affordable, efficient, easily accessible, open, flexible, well-designed, learner-centred, distributed and facilitated learning environments*. Universities, corporations and government agencies worldwide are beginning to offer courses on the Web. At all levels of these institutions, students and employees are being encouraged to take Web-based courses.

Designing and delivering instruction and training on the Web requires thoughtful analysis and investigation, combined with an understanding of both the Web's attributes and resources (Khan, 1997c) and the ways in which instructional design principles can be applied to tap the Web's potential (Ritchie and Hoffman, 1997, cited in Khan, 1997b). Designing Web-based courses for flexible, open and distributed learning environments is new to many of us. We need a comprehensive framework that can provide guidance in designing, developing, implementing and evaluating instructional and training materials.

## A FRAMEWORK FOR FLEXIBLE, OPEN, AND DISTRIBUTED LEARNING

With the Internet's rapid growth, the Web has become a powerful, global, interactive, dynamic, economic and democratic mediums of learning and teaching at a distance (Khan, 1997a). The Web provides an opportunity to develop learning-on-demand and learner-centred instruction and training. After reflecting on the factors that must be weighed in creating effective distributed learning environments, I developed a Framework for Advanced Distributed Learning (also known as a Framework for Web-based Learning) (Khan, 1997c). The seeds for the ADL framework (see Fig. 1) began germinating with the question "What does it take to provide best meaningful flexible learning environments for learners worldwide?"

Numerous factors help to create a meaningful learning environment, and many of these factors are systemically interrelated and interdependent. A systemic understanding of these factors can help designers create meaningful distributed learning environments. I clustered these factors into eight dimensions: pedagogical, technological, interface design, online support, management, resource support, ethical and institutional. Each dimension has several subdimensions, each consisting of items focused on a specific aspect of a Web-based learning (WBL) environment (Dabbagh, Bannan-Ritlan and Silc, 2000). With so many items within each subdimension, this chapter only discusses important issues related to designing, developing, implementing and evaluating a WBL environment.

## 1. PEDAGOGICAL

The pedagogical dimension of Web-based learning refers to teaching and learning. This dimension addresses issues concerning *content, goals/objectives, design approach, Organisation, methods and strategies, medium* and *evaluation* of Web-based learning environments.

### 1.1 Content

The *content* has to do with a course's subject matter. This section addresses both the type and accuracy of the course content.

### 1.2 Goals/Objectives

For meaningful Web-based learning environments, it is important for learners to have clear goals/objectives, and ways to achieve them. This section reviews the presence and clarity of those goals and objectives.

### 1.3 Design Approach

The pedagogical philosophy used in the overall design of the course shapes the learning environment. The *instructivist* philosophy espouses an objectivist epistemology, whereas the constructivist approach emphasises the primacy of the learners' intentions, experiences and cognitive strategies (Reeves and Reeves, 1997). The selected design approach for Web-based learning activities are dependent on the type of domain of knowledge (i.e., well-defined and ill-defined) of the course content.

### 1.4 Methods and Strategies

Instructional methods/approaches and strategies can be used in WBL to facilitate learning or help students achieve their learning goals and objectives. The methods used in a Web-based course will be based in part on the philosophical approach of the course. A variety of instructional activities can be incorporated into Web-based instruction and Web-based training to facilitate learning and the technical and structural attributes of the Web can be used to support these activities.

*Discussion* allows learners to share information, ideas and feelings among themselves and their instructors. Web-based discussions can be divided into two categories: asynchronous (time independent communication) and synchronous (real time communication). In a Web-based course, learners can be engaged in asynchronous discussions in three different formats: moderated discussion forums, unmoderated discussion forums, subject-related outside professional discussion forums. Asynchronous text communications tools are e-mail, mailing lists, newsgroups, etc.. Synchronous discussions can range from text-based to audio-video conferencing. Synchronous communications tools include messaging tools, and audio- and videoconferencing tools.

*Facilitation* gives mentors a chance to guide students, direct discussion, suggest possible resources, field questions, etc. (Bannan and Milheim, 1997). In a Web-based course, facilitation can be provided using various tools such as e-mail, mailing lists, discussion forums and conferencing tools.

## 1.5 Organisation

Web-based learning content should be organised with proper sequencing strategies (ordering of content) to help learners achieve their objectives and goals. In the presentation of contents, Web-based courses should always strive for clarity, style, readability and the usage of content relevant graphics (e.g., icons, buttons, pictures, images, etc.) and multimedia components (e.g., sound, audio, video, etc.).

## 1.6 Instructional Medium

In Web-based learning, the Web is the medium through which the message is communicated. The capabilities of the Web as a medium must be examined to see how its attributes and resources can be used effectively to facilitate learning (Khan, 1997a).

## 1.7 Evaluation

Online evaluation for WBL includes both *assessment of learners* and *evaluation of the instruction and learning environment* (Khan, 1997a).

### *Assessment of Learners*

Assessment pertains to authenticity, reliability, formats (e.g., multiple choice, case studies, etc.), test characteristics (e.g., adaptive and randomised), etc. Assessment of learners at a distance can be a challenge. Issues of cheating are a major concern (Wheeler, 1999). "Are students actually doing the work?" (Hudspeth, 1997) and "How do we know we are assessing fairly and accurately?" (Wheeler, 1999) -- such questions will always be of concern for online learning environment.

### *Evaluation of Instruction and Learning Environment*

The design of the course greatly influences the roles the instructors and students play in Web-based learning environment. This section deals with the performance of instructor and the review of learning environment (also discussed in *section 5.1 Maintenance of Learning Environment*).

## 2. TECHNOLOGICAL

The technological dimension examines issues related to *infrastructure, hardware* and *software* related to Web-based learning environments.

### 2.1 Infrastructure

Infrastructure for Web-based learning includes standards, policies and guidelines related to computer and related technologies, operating system, security, Internet connection and Internet services for instructors and learners.

### 2.2. Hardware

Hardware for Web-based learning may include computer, server, modem, networking devices, printer, scanner, camera, storage devices (e.g., hard drives, CD-ROM, etc.) and other equipment.

### 2.3 Software

Software for Web-based learning may include word processor, e-mail packages, presentation programme, spreadsheet, database, authoring tools, plug-ins, browsers, etc..

## 3. INTERFACE DESIGN

Interface design refers to the overall look and feel of a Web-based instructional and training programmes (Brandon, 1997). Interface design dimension encompasses *page and site design, navigation* and *usability*.

### 3.1 Page and Site Design

Page design relates to the physical appearance and clear functionality of the screen. Web-based learning environment should be designed to accommodate all learners, including people with disabilities, who encounter barriers due to poorly designed WBL. Images and videos without text alternatives are inaccessible to learners who are visually impaired for any reason.

### 3.2 Navigation

Navigation in a Web-based course should focus on how learners can move through the site with ease and reasonable speed. Clarity and consistent use of textual, graphic, and other Organisational markers throughout the site can contribute to the ease of use and speed (Simich-Dudgeon, 1998).

### 3.3 Usability Testing

Usability testing is a method of testing WBL to improve its interface design. Reeves and Carter (2000) categorise usability testing as follows: efficiency (i.e., cost and time saving), user satisfaction (i.e., ease of use, intuitiveness, visual appeal, etc.), and effectiveness (i.e., user retention over time). Guidelines for designing usable graphical user interfaces and Web pages can be found at: www.useit.com.

## 4. ONLINE SUPPORT

Both technological and human-based support throughout a Web-based course can help a course maintain momentum and become successful (Hill, 1997). This dimension deals with how a Web-based course can provide both *online instructional/counselling* support and all-purpose *technical* troubleshooting.

### 4.1 Instructional/Counselling Support

Guidance on study skills, time management and stress management are important components for WBL. Students should receive guidance on how to organize for online learning. Web-based learning method can be stressful for some students. It would be very useful and beneficial for students to receive some guidance on time and stress management, note taking, reading and writing guides, test anxieties, health and wellness, etc..

### 4.2 Technical Support

Online technical support is one of the most important support services for Web-based learning environments. Technical support services must be available to help students log on, upload and download files, etc..

## 5. MANAGEMENT

Management of WBL courses involves various individuals who are responsible for doing specific tasks and training. These individuals may include instructors, tutors, subject matter experts, project managers, instructional designers, editors, interface designers, course developers, graphic artists, media production specialists, programmers, consultants, Webmaster, etc.. A co-ordinated and co-operative effort by these individuals will result in the effective management of a WBL course. Issues in this dimension are clustered into two categories: *maintenance of learning environment* and *distribution of information.*

### 5.1 Maintenance of Learning Environment

Maintenance of the learning environment covers staffing, management of course content and learning resources, mechanisms for evaluation, and security measures etc..

### 5.2 Distribution of Information

Information distribution covers the delivery of both online and off-line Web-based learning materials including schedule, syllabus, announcements, course relevant contact information, learning and testing materials and students' grades from quizzes, assignments, exams, and projects. Students can access to testing materials and their grades by entering their password.

## 6. RESOURCE SUPPORT

The resource support dimension of the ADL framework examines the *online* and *offline resources* required to support learning. These resources include original documents, public domain books, summaries of or discussions about books in print, reference works (such as foreign-language dictionaries), scholarly papers, new concepts, notification of both face-to-face and online conferences, job information etc..

### 6.1 Online Resources

Online resource can include multimedia archives, mailing lists and their archives, newsgroups and their FAQs, dictionaries, Webliographies, recommended reading lists (e.g., BooksToRead.com), databases, online libraries, computer tutorials, experts online, electronic books, journals, magazines, newsletters, newspapers, documents etc..

### 6.2 Offline Resources

Offline resource can include books, journals, magazines, newsletters, newspapers, documents, reference works, experts, etc.. Institutions offering Web-based courses to geographically dispersed remote learners should provide suggestions or information about where to find library resources since many cannot use the host institution's library because of distance. Also, the host institution should consider joining a consortium of libraries worldwide so that their Web-based students can visit and loan books.

## 7. ETHICAL

Ethical considerations of Web-based learning relate to *social and cultural diversity, geographical diversity, learner diversity, information accessibility, etiquette* and the laws relating to these issues.

### 7.1 Social and Cultural Diversity

It is wonderful to be able to offer Web-based courses to global learners with different social, cultural, economic, linguistic and religious backgrounds. In designing Web-based learning environments, we should recognise the diversity of culture and learning styles in order to enable diverse learners to enhance their learning (Sanchez and Gunawardena, 1998).

### 7.2 Geographical Diversity

The use of appropriate date and time conventions in a Web-based course provides orientation for a widely distributed group of students. I recommend the use of the full-text dating convention (e.g., March 1, 2000 instead of 01-03-2000) and GMT, especially when arranging conference calls, online conferences and other collaborative activities.

### 7.3 Learner Diversity

A Web-based learning system should be designed to accommodate the needs of individuals with disabilities, including senior citizens whose hearing is impaired; in the US alone, it has been estimated that there are more than 30 million people with disabilities -- inborn, acquired and temporary.

### 7.4 Information Accessibility

In information society, information accessibility is a critical issue which must be discussed in terms of the gap between the digital "haves" and "have nots, "a gap expressed in the term "digital divide." In designing Web-based learning activities, digital divide issues should be considered to include the learners who are affected by this division.

### 7.5 Etiquette

A Web-based learning environment should have the guidelines for etiquette when students post messages on discussion forums and newsgroups. Etiquette provides rules for maintaining civility in interactions and covers issues associated with considerate behaviour. The etiquette promotes mutually respectful behavior in an online learning community.

### 7.6 Legal Issues

This section deals with legal matters such as privacy, plagiarism and copyright.

## 8. INSTITUTIONAL

It is vital for institutions of higher education to have clear strategies for online learning. These strategies must be supported by institutions' missions. Online learning initiatives require orchestration of personnel with diverse skills sets (Belanger and Jordan, 2000). Political factors often have significant impact upon the success of an online programme (Berge, 2000). The institutional dimension is concerned with issues of *academic affairs* and *student services* related to Web-based learning.

### 8.1 Academic Affairs

Academic affairs encompass faculty and staff support, instructional affairs admissions, registration and payment (e-commerce), academic computing services, graduation and alumni affairs, etc..

### 8.2 Student Services

Students taking Web-based courses should enjoy the equal academic and student services as those taking face-to-face courses. These services include orientation, bookstore, library support, financial aids, counselling and other student support services. For Web-based learners, institutions should consider providing toll-free numbers for all of these services.

## USING THE FRAMEWORK

The framework has the potential to provide guidance in designing Web-based learning materials, reviewing Web-based instruction and training courses (BooksToRead.com/wcr), organising resources for Web-based learning, designing comprehensive authoring systems, designing distributed learning systems, virtual universities and cyberschools. In my Web-based training (2000) book, the framework is used as the guiding mechanism for the following chapters:

- *Case Studies of Web-based Training Sites* by Khan, Waddill, and McDonald.
- *Pedagogy and Web-based course authoring tools: Issues and implications* by Dabbagh, Bannan-Ritland and Silc.
- *AuthorWeb- A conceptual framework for Web-based authoring system* by Khan, Ealy and Singh.
- *Web-based training resources* by El-Tigi and Khan.

## CONCLUSION

I hope, by describing various dimensions of the framework, I have provided a sketch of what it takes to create meaningful distributed learning environments. I believe various issues discussed in the eight dimensions of the framework can provide guidance in the design, development, delivery and evaluation of distributed learning environments. Various sub-dimensions and issues discussed within the eight dimensions of the framework are by no means complete. I welcome comments and suggestions for improvement (BooksToRead.com/framework).

## REFERENCES

- Banathy, B. H., (1992). *A systems view of education: Concepts and principles for effective practice*. Englewood Cliffs, NJ: Educational Technology Publications.
- Banathy, B. H., (1991*). Systems designs of education: A journey to create the future*. Englewood Cliffs, NJ: Educational Technology Publications.
- Bannan, B. and Milheim, W. D., (1997). "Existing Web-based courses and their design." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Belanger, F. and Jordan, D., (1999). *Evaluation and Implementation of Distance Learning: Technologies, Tools and Techniques*. Hershey, PA: Idea Group Publishing.
- Berge, Z. L., (2000). "Evaluating Web-based training programmes." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Berge, Z. L., Collins, M. and Fitzsimmons, T., (2000). "Advantages and disadvantages of Web-based training." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Bonk, C. J. and Reynolds, T. H., (1997). "Learner - centred Web instruction for higher-order thinking, teamwork and apprenticeship." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Brown, K. G., Milner, K. R. and Ford, J. K., (2000). "Repurposing instructor-led training into web-based training: A case study and lessons learned." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Brown, J.S., Collins, A., and Duguid, P., (1989). "Situated cognition and the culture of learning.", *Educational Researcher, 18* (1), 32-42.
- Campbell, S. M., (1999). "Understanding your needs: Overcoming the personal barriers to success in distance learning." In G. P. Connick (Ed.), *The distance learner's guide*. Upper Saddler River, NJ: Prentice Hall.
- Connick, G. P. (Ed.)., (1998). *The distance learner's guide*. Upper Saddler River, NJ: Prentice Hall.
- Cornell, R. and Martin, B. L., (1997). "The role of Motivation in Web-based instruction." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Dabbagh, N. H., Bannan-Ritland, B. and Silc, K., (2000). "Pedagogy and Web-based course authoring tools: Issues and implications." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.

- Gordon, S. E., (1994). *Systematic training programme design: Maximising effectiveness and minimising liability*. Englewood Cliffs, NJ: Prentice Hall.
- Heinich, R., Molenda, M. and Russell, J., (1993). *Instructional media and technologies for learning*. Upper Saddle River, NJ: Prentice-Hall, Inc.
- Hall, B., (1997). *Web-based training cookbook*. New York: Wiley.
- Hannum, W., (2000). "Web-based training: Advantages and limitations." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Harasim, L., (1990). "Online education: An environment for collaboration and intellectual amplification." In L. Harasim (Ed.), *Online education: Perspectives on a new environment*. New York: Praeger Publishers.
- Hart, J., (1999). "Improvng distance learning performance." In G. P. Connick (Ed.), *The distance learner's guide*. Upper Saddler River, NJ: Prentice Hall.
- Hill, J. R., (1997). "Distance learning environments via the World Wide Web." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Jones, M. G. and Farquhar, J. D., (1997). "User interface design for Web-based instruction." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Khan, B. H. (in press). "Discussion of resources and attributes of the Web for the creation of meaningful learning environments." , *Cyber Psychology and Behavior Journal*.
- Khan, B. H., (1999). Interviewed by Debra Donston for an article entitled "From the trenches: Distributed learning is high priority", *PCWEEK, 16*(46), p. 134.
- Khan, B. H., (June, 1998). "Web-based instruction: An introduction.", *Educational Media International*. 35(2), 63-71.
- Khan, B. H., (1997a). "Web-based instruction: What is it and Why is it?" In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Khan, B. H., (1997b). "A framework for Web-based learning". *Paper presented at the Instructional Technology Department*, Utah State University, Logan, UT.
- Moore, D. R. and Lockee, B. B., (2000). "Design strategies for Web-based training". In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Moore, M. G., (1998). "Introduction". In C. C. Gibson (Ed.), *Distance learners in higher education*. Madison, Wisconsin: Atwood Publishing.

- Newby, T. J., Russel, J. D., Stepich, D. A. and Lehman, J. D., (1996). *Instructional technology for teaching and learning: Designing instruction, integrating computers, and using media*. Hillsdale, NJ: Prentice Hall.
- Palloff, R. M. and Pratt, K., (1999). *Building learning communities in cyberspace*. San Francisco, CA: Jossey-Bass Publications.
- Pappo, H. A., (2000). "Simulations for Web-based training." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Price, R. V., (1999). "Designing a college Web-based course using a modified personalised system of Instruction (PSI) model.", *TechTrends, 43*(5). 23-28.
- Rice, J., Coleman, M. D., Shrader, V. E., Hall, J. P., Gibb, S. A. and McBride, R. H., (2000). "Developing Web-based training for global corporate community." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Reeves, T. C. and Carter, B. J., (2000). "Usability testing and return-on-investment studies: Key evaluation strategies for Web-based training." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Reeves, T. C. and Reeves, P. M., (1997). "Effective dimensions of interactive learning on the World Wide Web." In B. H. Khan (Ed.), *Web-based instruction*. Englewood Cliffs, NJ: Educational Technology Publications.
- Reigeluth, C. M., and Khan, B. H., (1994, February). “Do instructional systems design (ISD) and educational systems design (ESD) really need each other?” *Paper presented at the Annual Meeting of the Association for Educational Communications and Technology* (AECT), Nashville, TN.
- Romiszowski, A. J. and Change, E., (2000). "A practical model for conversational Web-based training: A response from the past to the needs of the future." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Rothwell, W. and Kazanas, H.C., (1992). *Mastering the instructional design process*. San Francisco: Jossey-Bass Publishers.
- Sanchez, I. and Gunawardena, C. N., (1998). "Understanding and supporting the culturally diverse distance learner." In C. C. Gibson (Ed.), *Distance learners in higher education*. Madison, Wisconsin: Atwood Publishing.
- Schmitz, J., (2000). "Needed: Digital libraries for Web-based training." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Simich-Dudgeon, C., (1998). "Developing a college web-based course: Lesson learned.", *Distance Education*, 19(2), 337-357.

- Smith, P. L., and Ragan, T. J., (1993). *Instructional design*. New York, NY: Macmillan Publishing Company.
- Thiagarajan, S. and Thiagarajan, R., (2000). "Playing interactive training games on the Web." In B. H. Khan (Ed.), *Web-based training*. Englewood Cliffs, NJ: Educational Technology Publications.
- Walls, J., (1993). "Global networking for local development: Task force and relationship focus in cross-cultural communication." In L. Harasim (Ed.), *Global networks: Computers and international communication*. Cambridge, MA: MIT Press.
- Wheeler, S., (1999). "Convergent technologies in distance learning delivery.", *TechTrends, 43*(5). 19-22.

For additional readings in Web-based learning and distance education, please visit Recommended Books Site at http://BooksToRead.com/DE.

TEND 2000

## Crossroads of the New Millennium

# Using Computer Technology To Assist Learners Learn Interactively

Prepared and Presented

By

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Saturday 8 April, 2000

Workshop 1

# Abstract

Educators have an array of different media at their disposal and each provides different opportunities. This workshop focuses on how a particular approach to computer assisted learning can involve students actively in the learning process.

The use of a problem solving approach is a highly regarded way to facilitate student learning. Frequently the resolution of problems involves the student making several successful component decisions. Each student will respond to the problem situation in their own way and they will benefit from feedback and assistance that is relevant to their particular component responses. To do this for each student in a conventional class situation is difficult, but technology can be employed to overcome such limitations. Technology can be a tool for the educator to provide each student with the equivalent of a personal tutor at their shoulder giving immediate feedback and guidance.

This workshop will involve participants exploring these issues. In his presentation Chris Morgan will demonstrate the features of one problem solving application he developed at low cost for use in a financial management subject area. It is used with both on-campus students and those who are remotely located from the university. For those at a distance it is distributed as a CD-ROM.

# Using Computer Technology To Assist Learners Learn Interactively

## INTRODUCTION

From the student perspective, they will want to achieve satisfaction of their own learning goals and expectations and to do things that involve them in their own learning process. Our institution will want us to do this in an efficient and cost-effective manner. For our own part, we will want the reward of our students reacting positively to us and to our teaching methods, and we will appreciate recognition of this by our peers and institutions. We will prefer to spend our precious time in creative pursuits as educational builders rather than being bogged down dealing with the routine.

We can look to using technology in our teaching to help us achieve these outcomes.

## USING TECHNOLOGY TO OVERCOME BARRIERS

Focus questions

1. What restrictions confront traditional classroom instructors from attending to the learning needs of their individual students?
2. How can technology be used to overcome such restrictions?

| Restrictions | Technology response |
|---|---|
| | |

## GROUP EXPERIENCES

Here we are looking to you to reflect on instances from your own experience where technology has been employed to enhance the effectiveness of the learning process.

Please tell us about one such instance.

- *How well did it work?*
- *What did it involve? Was it cost effective? Is it ongoing?*
- *How was it received by students and administrators?*

## CASE STUDY

### CD-ROM Financial Procedures

In the Faculty of Rural Management of the University of Sydney, most undergraduate students study a unit in Business Finance. The unit content area is mathematically based and a number of the students come to it lacking confidence in their ability to succeed in this area. They need to have some successful early learning experiences in order to build their confidence and remain motivated to progress through the unit.

Aspects of the unit for both on-campus and students at a distance are print based. Students are involved in building their skills through engagement with developmental exercises which progress from the simple to the more complex. The students can check their work against model answers supplied.

The successful resolution of these exercises involves the student working in a systematic manner through various steps. At each step, the student has to make a decision and the outcome of that particular decision affects subsequent computations. Thus it is important for the student to have the skills and knowledge required to make the correct choice at each decision point.

In engaging with these exercises in the print version, the students proceed to the conclusion of an exercise then check their performance against the model answer provided. The problem with this standard approach is that often the student makes a decision error early in their resolution of the problem and this causes subsequent work on that exercise also to be in error.

Technology provided the tools to address this deficiency with the process. It enabled a strategy to be devised that would overcome this weakness in the learning process and give each student feedback and guidance at every decision point in their problem resolution process. It was planned that, when they made correct decisions, they would immediately receive the reward of knowing they were on the right pathway. When their decision was not the right one they would receive feedback as to why they were in error and be invited to reconsider the situation before proceeding.

For each exercise, all the progressive decision points were identified and the exhaustive set of choices at each point anticipated. Additionally the reasoning students might employ to make their correct or incorrect decisions was anticipated. The reasoning is important as students might make a correct decision but for the wrong reason. Should this occur they still require appropriate feedback.

The computer managed learning program is highly interactive; on each screen the student is asked to make a choice from the selection provided and, where relevant, to select the appropriate justification for their choice. They receive immediate feedback and guidance and once they achieve success at that stage they move on to the next decision point.

The intent with the programme is that it is completely self-supporting for students who have been working their way through the associated print Learning Guide. At each point in the programme where students have made a decision there is a relevant explanation. For those experiencing particular difficulty there is access to an embedded tutorial.

The programme provides an additional dimension of support and guidance to students to what could be achieved through conventional teaching approaches. It involves students utilising a different learning style and gives them an additional opportunity to practice their learning. A major benefit is that the provision of instant feedback and guidance at each decision point develops the student's confidence and thus motivation to proceed.

TEND 2000

Crossroads of the New Millennium

# Engineering Curriculum Development: Balancing Employer Needs And National Interest – A Case Study.

Prepared and Presented

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# Abstract

In developing engineering curriculum, one has to balance the needs of the employer, academics and the interest of a country. This is especially true for a developing country where the government, rightly or wrongly, has to play an active role in 'shaping' the future graduates. The decision on the content of the curriculum becomes more complex when all the needs above are deemed important and limited material only can be taught within the prescribed duration of an engineering programme. This paper discusses and shares our experience at the Faculty of Mechanical Engineering, University Teknologi MARA, Malaysia in developing the structure of such curriculum for its undergraduate programmes.

# Engineering Curriculum Development: Balancing Employer Needs and National Interest – a Case Study

## INTRODUCTION

Developing an engineering curriculum is not an easy task. Several aspects need to be looked into before a 'balanced' curriculum can be developed. The expectation of the future employer, the student (prospective as well as current), the perception of the academics, accreditation bodies and the interest of a country all need to be taken into account. We have to be selective to include in the curriculum only materials that are considered useful since the duration for the programme is limited and as such not all material or subjects deemed important by the various groups can be included.

In Malaysia, engineering programmes are generally of three or four-year duration (120 credit hours minimum) after STPM (*Sijil Tinggi Persekolahan Malaysia* which is equivalent to United Kingdom's GCE A-level) or four or five-year duration after SPM (*Sijil Pelajaran Malaysia* which is equivalent to United Kingdom's GCE O-level). There have been much deliberations on the most appropriate and practical total duration for an engineering programme i.e. whether it should be a three or four-year programme after STPM and four or five-year programme after SPM. Recent meeting of the Malaysian Council of Engineering Deans has recommended that the programme be extended to four years after STPM and five years after SPM. Despite this longer duration, the amount of material to be covered is enormous compared to the amount of time available.

This paper shares our experience at the Faculty of Mechanical Engineering (FKM), Universiti Teknologi MARA (UiTM), Malaysia, in developing the curriculum structure for its undergraduate programmes. The discussion is limited to developing the structure of the curriculum only, and not the other aspects of provision of education such as facilities available, quality of lecturers, criteria for selection of students etc. The medium of instruction for the programmes of study offered was originally in English, then changed to the national language (Malay) before finally strongly encouraged to be in English. The curriculum design took into account the developments in the United Kingdom and the United States-e.g. trend towards B.Eng./M.Eng. (three years / four years) and B.S.E./M.S.E. (four years / five years). Accreditation guides and requirements from LJM (*Lembaga Jurutera Malaysia* or Board of Engineers Malaysia), IJM (*Institusi Jurutera Malaysia* or Institution of Engineers Malaysia) and Engineering Accreditation Commission of ABET (Accreditation Board for Engineering and Technology, USA) were widely consulted.

## DEFINITIONAL ASPECT.

It is important to know the meaning of the term engineering before proceeding with further discussions. Engineering, according to ABET is "that profession in which knowledge of the mathematical and natural sciences gained by study, experience and practice is applied with judgement to develop ways to utilise, economically, the materials and forces of nature for the benefit of mankind" – Criteria For Accrediting Engineering Programmes, Engineering Accreditation Commission, ABET, Baltimore, USA. Therefore, if one took the above as the definition of engineering, the development of an engineering curriculum should ensure producing engineers with the above qualities as its prime objective. Hence subjects included in an engineering programme (the curriculum) must be selected accordingly. Developing engineering curriculum to closely abide by the lines of the above definition might not be fully satisfactory to the employers, or in the interest of the nation (more so a developing nation). Therefore a good curriculum need to not only satisfy the definition, but also fulfill the designed goal or objectives. In this respect there might be a need to redefine engineering if abiding by the definition fails to produce the required output.

## THE ISSUE - EMPLOYER NEEDS VS. NATIONAL INTEREST.

The issue here is whether the engineering curriculum should be developed for the employer's market or so that it can contribute towards the development of the nation. Of course there is an overlap between employer needs and national interest. When this occurs, it is straightforward but, when fulfilling the need of one, means denying the other, a certain approach or methodology needs to be applied in order to come up with a balanced curriculum. The way this is done is shown later under the section The Model Structure. For now, the different qualities of engineering graduates desirable by the above mentioned parties will be highlighted.

Employers are looking for engineering graduates that are well rounded and possess multi-disciplinary, systems perspective. Ideally for them the graduates must be competent technically as well as possessing management, communication and interpersonal skills. The command of English is also considered an asset due to the current trend of globalisation. Further those who, upon graduation, are able to perform jobs assigned to them with minimum or no further training and supervision are more desirable.

On the other hand, a country, especially a developing one, needs to produce graduates that can contribute toward national development agendas. In Malaysia at one point, due to the inadequacy of supply of the engineers, the Government encouraged reducing the duration of engineering programme from four year after STPM to three years after STPM to ensure the output of engineers is sufficient to meet the demand created by the fast pace of development. The rationale at that time was that the lessened duration would still be equivalent to the United Kingdom's three year B.Eng. programme duration. It is also in the interest of a nation to ensure that the engineering workforce has a high professional conduct, morally upright and ethically correct.

Additionally the government encourages the use of English as the medium of instruction especially for professional programmes. It used to be that the Government promotes the use of the national language in the interest of national unity. The issue here is whether it is better to maintain the language at the expense of people or the people at the expense of the language. Of course this is debatable.

There are several bodies that draw guidelines and/or requirements expected of engineering graduates. These guidelines and/or requirements act as a baseline or basis for institutions to fulfill in designing their engineering programmes. For example, ABET have the following criteria expected of an engineering programmes (ABET 2000 Criteria No. three: Programme Outcomes and Assessment) i.e. *Engineering programmes must demonstrate that their graduates have:*

1) *an ability to apply knowledge of mathematics, science, and engineering*
2) *an ability to design and conduct experiments, as well as to analyze and interpret data*
3) *an ability to design a system, component, or process to meet desired needs*
4) *an ability to function in multi-disciplinary teams*
5) *an ability to identify, formulate and solve engineering problems*
6) *an understanding of professional and ethical responsibility*
7) *an ability to communicate effectively*
8) *the broad education necessary to understand the impact of engineering solutions in a global and societal context*
9) *a recognition of the need for and an ability to engage in life-long learning*
10) *a knowledge of contemporary issues*
11) *an ability to use the techniques, skills and modern engineering tools necessary for engineering practice.*

The same function above is carried out by Engineering Council in the United Kingdom and by LJM (Board of Engineers Malaysia) in Malaysia.

The organisations above attempt to balance the minimum standard expected of engineering programmes and the autonomy that needs to be given to institutions of higher learning in order not to stifle their creativity and purpose. Through accreditation guidelines, these organisations prescribe what are expected of engineers by specifying what engineering programmes should or ought to be. This might not fully coincide with what the employer need and might not be in the interest of a nation.

The government (represents the nation as it is elected by the people) will also have a set of criteria or rules in order to define what is in line with the interest of a country. This is done through regulations and rules. The government of Malaysia, through its Ministry of Education, for example, has made it compulsory for universities to teach the subject, Civilization, as it deemed as important in promoting understanding between its citizens of different ethnic background. (Similar to the subject United States History in the United States). The Ministry also intends to enhance the standard of English by introducing and making the subject MUET (Malaysia University English Test) compulsory. (Similar to TOEFL in the USA and IELTS in the United Kingdom). At the same time programmes at degree level are encouraged to be taught in English. This is done to defend the interest of the nation (rightly or wrongly) in the wake of internationalisation and globalisation. (Previously tertiary education in Malaysia was taught in Malay to unite the various communities in the country through a single language). Of course, it can be argued as to whether giving way to internationalisation (in education) is really protecting the interest of a nation.

Academics on the other hand tend to emphasise the knowledge aspects-i.e. the causes and root of things. They will stress more the fundamentals, mathematics and sciences. For them the engineering students must be competent in these area first before they move on to the application aspects. Practicing engineers though think differently, that, although mathematics and the sciences are important, they are secondary compared to the application and hands-on experience. This is further substantiated as numerous engineering works these days is solved using powerful application softwares where understanding of the problem to be solved (i.e. the structuring of the problem) is more important.

It is not easy to consolidate these divergent views. This paper takes into consideration all these perspectives before suggesting a suitable curriculum model. The experience of developing the engineering curriculum shows that it is very important to have a clear objective, failing which it will be very difficult to converge the divergent views.

## THE APPROACH.

First, other established models were studied to see how they develop the engineering curriculum and balance the various needs and requirements. Most of this model is obtained from the Internet sites of universities in the United States, United Kingdom, and Malaysia itself. More weight was given to the overseas model as it is more established and has stood the test of time.

The Engineering Criteria 2000 by ABET was carefully studied and used as one of the sources of references so that the designed curriculum is comparable to international standards and practices. Malaysian guidelines consulted are:

1) Requirements in Curriculum Design and Review, Lembaga Jurutera Malaysia (Board of Engineers Malaysia),
2) Guidelines on Recognition of Engineering Courses, Institusi Jurutera Malaysia (Institution of Engineers Malaysia) and
3) Requirements of Ministry of Education, Malaysia.

It is proposed that the entry to the undergraduate engineering programme be allowed at both STPM and SPM levels. For entry at SPM level the duration of the programme is one year longer than with STPM qualification. The proposed duration of studies is four years for SPM entry (126-136 credit hours) and three years for STPM entry (110-120 credit hours). This is in accordance with the guidelines provided by the Ministry of Education, Malaysia. As such the degree of B.Sc. (Mechanical Engineering) will be awarded to those who completed the total credit hours (above) and upon satisfaction of the normal graduating criteria. (Students awarded this degree are considered to have satisfied the basic requirements).

The curriculum structure for the B.Sc. (Mechanical Engineering) above was designed so that the requirements of various parties above as much as possible are fulfilled within the stipulated duration. Some of the requirements are found to be too demanding. IJM, for example, requires that the student completes a minimum of 120 credit hours and that engineering subjects shall constitute at least two thirds of the total course content. This minimum requirement on engineering subjects is difficult to fulfill within the timeframe above. The requirement of the Ministry of Education (110-120 credit hours after STPM) however, despite being demanding on students, is still achievable. On the other hand, it is still possible to fulfill demands by the employer within the above timeframe provided some of the subjects deemed important by academics are simplified in their treatment or abridged. Satisfying the requirements of all parties will definitely require longer duration than the above. As such, an extra year beyond B.Sc. is proposed. Upon satisfactory completion of the programme, the candidate is awarded B.Eng. (Mechanical). This programme is designed to satisfy the minimum requirement of all the parties above and to be a fully accredited programme.

The approach and attempts to fulfill as many criteria as possible as demanded by various interested parties. Students who satisfy basic requirements only will be awarded the B.Sc. (Mechanical Engineering) rather than the B.Eng. (Mechanical). English is proposed as the medium of instruction but students should be given remedial English classes where appropriate to ensure that they can learn optimally in that language. Despite the extra year, still there are subjects demanded by various parties that cannot be fitted into the developed curriculum. For this reason electives are suggested.

## THE OUTCOME – THE MODEL STRUCTURE.

It is proposed that the faculty offers both the basic (B.Sc. (Mechanical Engineering)) and the extended programme (B.Eng. (Mechanical)). While it is not possible to include all the subjects demanded by various parties even with the extended programme, the minimum requirements set under each programme are nevertheless met within the prescribed duration. The electives made available to the student will consolidate and reinforce their knowledge in a particular area so that they are able to explore their interest and inclinations better. The result is a curriculum structure that not only fulfills the minimum requirements of accrediting bodies but also fills the remaining time with subjects that contribute towards fulfilling the planned objectives of students. The basic programme (four years after SPM or three years after STPM) satisfies the most basic requirements while the extended programme (five years after SPM or four years after STPM) attempts to satisfy all the requirements for accreditation. The requirements include employer needs, the national interest as well as the perceived requirements by parties that think they know the subject best. A summary of the outcome follows.

## THE MODEL STRUCTURE.

*Medium of instruction:*

English except for certain subjects such as social science and humanities. This is consistent with the national interest where the government wants the graduates to be able to compete in the international arena.

*Programme Proposal – Two-tier system:*

Basic programme (four years after SPM and three years after STPM) to be named B.Sc. (Mechanical Engineering) for government accreditation.

Extended programme (five years after SPM and four years after STPM) to be named B. Eng. (Mechanical) for accreditation by both the government and the accrediting bodies within and outside Malaysia.

*Academic load:*

Between 15-17 credit per semester.

*Programme content:*

Basic programme

| | |
|---|---|
| Mathematics and sciences: | 32 - 36 credit hours |
| Humanities and social sciences: | 25 - 31 credit hours |
| Engineering and design: | 60 credit hours |
| Free electives: | 9 credit hours |
| Total: | 126 – 136 credit hours. |

Extended programme

Total of 30-32 credit hours inclusive of technical electives, ethics and professional responsibilities, and free electives in addition to the basic programme above.

Special programme: Interdisciplinary programme should be offered to good students only and at B.Eng. level (extended) only.

Feature:

- The model allows students to do their own planning with minimum supervision.
- Allows for international exposure through provision for international exchange or internship during the extended year.
- Specialisation allowed only in the extended year.

## RATIONALE OF THE MODEL

The model developed above attempts to ensure that the intended goal of the curriculum is achieved. It provides the required flexibility while at the same time is comprehensive enough to cover the whole range of needs or requirements from employer, national interest, academics, students themselves and other interested parties. The model also took into account the effect of globalisation by recommending that the programme be conducted in English and opening up opportunities for international exchange and internships.

It is, of course, not possible for the curriculum to include everything that is deemed important. The best that can be done is to satisfy as much as possible the needs and requirements within the duration of the programme. Balancing of the various requirements is reasonably achieved without losing sight of the main objective of producing graduates that can contribute towards the development of the country.

## CONCLUSION

Employers are looking for engineering graduates that are well rounded and possess multi-disciplinary, systems perspective. Ideally for them these graduates must be competent technically as well as possessing management, communication and interpersonal skills. On the other hand, academics emphasise on the knowledge aspect. A country, especially a developing one, needs to produce graduates that can contribute toward national development agendas.

It can be concluded that it is possible to develop a curriculum that can address the above provided one decides the programme educational objectives from the onset. In this regard, therefore, one should expect that the details of the curriculum would be different from one university to another depending upon their educational objectives and priorities. However the content of the programme should still be recognisable as Mechanical Engineering. The government, in order to fulfill its development agenda could still have a hand in 'shaping' the graduates through the introduction of a group of compulsory courses/subjects that must be offered by all degree-awarding institutions. It is hoped that the above experience will be of benefit to this seminar. The experience in designing the curriculum for engineering programme can be directly applied to the development of curriculum in technological programmes.

## REFERENCES

- *Requirements in Curriculum Design and Review*, LJM (Board of Engineers Malaysia), Malaysia.
- *Guidelines on Recognition of Engineering Courses*, IJM (Institution of Engineers Malaysia), Malaysia.
- *Garis Panduan bagi Cadangan Kursus Baru,* (Guidelines for new programme proposals). Ministry of Education, Malaysia.
- *Silibus kursus Sarjana Muda Kejuruteraan Mekanikal* (Syllabus for B.Eng (Mechanical Engineering)), Fakulti Kejuruteraan Mekanikal, Universiti Teknologi MARA, Malaysia.
- *Criteria for Accrediting Engineering Programmes*, Engineering Accreditation Commission, Accreditation Board for Engineering and Technology (ABET), Inc., USA.

TEND 2000

Crossroads of the New Millennium

# A Passport To Flexible Learning: An Orientation Program Designed To Introduce First Year University Students To Interactive Teaching Technologies

Prepared and Presented

By

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Workshop 2

# Abstract

For students coming to university for the first time, experiences with new technologies used in teaching can be daunting, even threatening. Research has shown that learners not adequately trained in using the technology cannot participate effectively in interactive instruction and that new users of a technological medium are often fearful. Where learners are inexperienced in interacting with the medium, they focus on the interface rather than on learning from the content. To overcome these problems, an orientation programme familiarising students with interfacing techniques was designed and delivered before formal academic programmes commenced.

The programme, called a 'Passport to Flexible Learning', exposed first year university students to teaching approaches significantly different from traditional methods by giving them 'hands-on' experience with a range of interactive teaching technologies. Teaching was organised in the form of workshops that ran concurrently over a five-day period during Orientation Week. A total of 400 internal and external students and twenty academic and general staff from a number of faculties and divisions participated in this innovative programme. Students were given a passport and, on successful completion of each workshop, they had an appropriate page in their passport stamped. The completed passport was a record of participation in a range of activities and represented the successful transition into the world of electronic classrooms.

This paper describes the evolution of the programmeand argues that universities need to orientate beginning university students into the world of electronic classrooms early in their course. After undertaking the programme, students reported that they felt much more confident in participating in teaching that involves interactive technology.

# A Passport To Flexible Learning: An Orientation Program Designed To Introduce First Year University Students To Interactive Teaching Technologies

## INTRODUCTION

During the 1990s, advances in communication technologies have changed the face of traditional university teaching. There has been a move from talk to touchpad. Teaching has shifted from the traditional face-to-face lecture to a virtual educational experience where information is transmitted and received in digital form. To date, the move to deliver units of study electronically has not been accompanied by an understanding of who the current students are, the extent of their previous experience with technology and their expectations of university study (Peel, 1999).

The higher education system in Australia, too, has changed considerably in the last decade. Under a federal Labor government, the expansion of universities after 1987 resulted in a significant growth in the number of institutions and a corresponding increase in the number of enrolled students. Today's university student population represents a much broader range of backgrounds than in the past (Hodge, 1995). They are no longer an elite academic group, but are more like school students in their range of ability.

Students come to university from a background of traditional education more suited to the ordered linear and predictable way of life that is characteristic of the modern period (Giddens, 1987; 1991). Giroux (1990) contends that such a background does not account for the universal social, political, economic and technological changes that are a feature of the current era. Nor does the modernist position deal with the uncertainties, diversities and differences that underpin those changes.

Giroux (1990:10) describes the current 'post modern' era as "a world without stability, a world where knowledge is constantly changing". Ball (1988) maintains that if people are to thrive in this world they will need 'passports' to three different educational arenas: traditional education, vocational education and education to promote the development of enterprising people. Ball uses the metaphor of educational passports to define a person's rite of passage to lifelong learning.

A challenge for higher education is how to respond to the complexity of constant change and technological advances. Some universities retain traditional methods of teaching, while others are realising the need to respond to the changing world by incorporating innovative technology into the delivery of units of study (Barnard, 1992). It is the smaller and newer institutions that are able to take advantage of recent technology (NBEET, 1996:22). For example, Central Queensland University (CQU) is a regional institution with five geographically isolated campuses that span the coastline from Mackay to Bundaberg (a distance of 630 km). As such, it has proved to be a fertile ground for the emergence of flexible teaching and learning approaches that have attempted to address the problem of distance. The need to connect students at different sites to a university lecturer has seen the adoption of large screen videoconferencing as the University's major delivery system. Currently, over 100 hours of videoconference teaching and learning activities are conducted across campuses each week at CQU.

It is apparent that, if a university is to deliver units electronically and do so effectively, the interaction between the learner and the medium's interface has to become automatic, like turning the pages of a book. However, research indicates that, at entry to university, students are much less technology-literate than anticipated (Cuskelly, Purnell and Lawrence, 1995; Anwyl, 1996; Burmeister and O'Dwyer, 1996; Thompson, Winterfield and Flanders, 1996). They are not prepared for learning and teaching approaches that are different from the traditional (Gilcher and Johnstone 1988; Cutright, 1993; Peel, 1999) and new users of a technological medium are often fearful (Rheingold, 1990).

Difficulties for students sometimes encompass more than the physical manipulation of the interface. Research has shown that learners not adequately trained in using the technology could not participate in interactive instruction (Gilcher and Johnstone, 1988). Mizell and Carl (1994) report that the psychological barrier is considered 'formidable' where faculty members and students are at different locations. They stress the need for practice so that students feel comfortable with the medium.

More specific problems were identified in a small, local study of first year Education and Health Science students (n=131) from four CQU campuses who had participated in a videoconferenced unit (Jones, et al., 1998). Students generally expressed feelings of intimidation and personal inadequacy when first confronted with teaching via videoconference. The experience was "very nerve racking". Students were "afraid of the equipment", "really self conscious", "easily distracted" and "overawed". In response to these concerns, the *Passport to Flexible Learning* programme was designed to 'desensitise' students to the potential intimidation of their initial contact with new teaching technologies.

## THE IMPORTANCE OF ORIENTATION

The *Passport to Flexible Learning* took advantage of the first point of contact with students – orientation. It has been argued that students look for relevant and meaningful learning activities during orientation week (McInnes and James, 1995; Dearn, 1996). However, incoming students at many universities are offered an orientation into university life that could only be described as 'narrow'. For example, past orientation programmes at CQU focussed primarily on reading and writing skills, how to reference assignments, general study skills, time management and basic computing skills. Much of the orientation was delivered in lecture format where students were passive recipients of information. The 'talking heads syndrome' and 'information overload' typified the design of the programme. There was little co-operation between faculties. Indeed, many faculties regarded orientation as someone else's problem and left this important time to the service divisions and the Student Association. Accordingly, the programme was fragmented and ineffective.

The *Passport to Flexible Learning* project was as much a response to these problems as a push to familiarise students with teaching technologies. The technology component of this project acted as glue that held together a much more holistic approach to orientation. It was central to the success of Orientation Week. It drew together academics and general staff from all faculties who worked in teams voluntarily for the period of orientation week. This involved a substantial time commitment and meant presenting as many as 12 one-hour workshops over a five day period. A positive outcome of this was that staff took a collective responsibility for the success of the programme. Participation in the planning and implementation of the programme led to a sense of ownership that had not existed previously.

Because most sessions were planned and presented as 'hands on' workshops, the emphasis was on actively 'doing' rather than passively 'listening'. At the same time, because students were assigned to groups randomly, they were able to work with students and academics from other faculties. This was also valuable to academics and helped establish a rapport with a range of students. Activities were designed to encourage students to socialise within groups and inter-group competitions were organised to bolster communication across groups. A central assumption of the programme was that orientation is as much about establishing a feeling of belonging to a community of learners as it is about learning how to study.

Although this paper focuses on the technology component of the orientation programme, it must be emphasised that the technology component was like a clothes-line on which all the other components were pegged. It was central to the success of the whole orientation programme. The Passport programme was not designed specifically to introduce students to communication technologies that they were likely to meet in their studies. On the contrary, the technology component was used because it offered a platform by which an outdated, uninspiring, fragmented orientation programme could be rejuvenated into an exciting, fun and worthwhile experience. This mirrors the idea that technology is used best when it underpins good practice, when it plays a subservient role to the task in hand, when, like turning the pages of a book, it does not remain in our consciousness. It is there, but invisible. Yet, at the same time, it is crucial to the success of the activity being undertaken.

## THE PASSPORT TO FLEXIBLE LEARNING PROJECT

The aims of the *Passport* programme were founded on the premise that practical experience at the interfaces of a range of communication technologies, before the onset of classes, dispels the apprehension that students express about using communications technology. Achieving the specified competencies for each workshop helps engender a feeling of familiarity and confidence that carries over to students' first academic interaction with each medium of communication technology.

The *Passport to Flexible Learning* programme was a response to three specific educational problems:

1. First year university students lack the experience and proficiency to utilise successfully the communication technologies likely to be used in teaching and flexible learning.
2. Learners who are inexperienced in interacting with electronic media, focus on interacting with the interface rather than on learning from the content. This requires experience, training and instruction (Norman, 1988:17). The interface itself should be a tool to be used and its manipulation should not demand the student's attention and energy (Hillman, Willis and Gunawardena, 1995).
3. If instruction on using the interface takes place as part of the unit being studied it competes with the course content and does not ensure uniform minimal proficiency.

To overcome these educational problems, a programme familiarising students with interfacing techniques was developed and delivered before formal academic programmes commenced and followed up by sessions undertaken in the early weeks of the semester. The project was developed around key learning principles particularly relevant to adult learners. These principles included helping students build on existing knowledge. The planned activities were relevant to the students' academic progress, included group learning approaches and gave students responsibility for their learning. Finally, there was immediate feedback on students' learning, recognition of learner differences and provision to practise new skills.

## DESCRIPTION OF THE PROJECT

A five-day programme in Orientation Week was designed to increase students' confidence and proficiency at the user/medium interface. Almost all of the incoming students participated voluntarily in the programme. The success of the *Passport to Flexible Learning* project depended on three crucial elements. First, it was necessary to produce clearly written instructional materials that were essential for helping students understand the range of technologies being used. A set of these materials was presented to students in a resource folder, which also contained a passport. Secondly, the *Passport to Flexible Learning* project involved a team of lecturers from a number of faculties and divisions. Thirdly, wherever possible, instruction in the technology included interactive link-ups between campuses so that students could experience the dynamic, exciting nature of teaching and learning using a multimedia approach.

Workshops ran concurrently during Orientation Week, and students:

- participated in a large screen and small screen videoconference, a teleconference and an audiographics session;
- summarised the main points from a tutored video instruction (TVI)* lecture;
- communicated via e-mail;
- downloaded data from the Internet; and
- searched and located information from on-line library catalogues.

[*TVI was used extensively in the past at CQU, but is gradually being replaced by videoconference. TVI uses a videotaped lecture from the main campus, which is shown at another campus where a tutor is on hand to answer students' questions.]

Using Colin Ball's (1988) concept of a passport as defining a person's rite of passage, the project used a passport to record the student's progress during Orientation Week. When the specified competencies associated with a particular medium of communication technology were achieved, the page was signed and stamped, signifying a milestone passed on the journey to successful university study. Having accomplished successfully the set of learning outcomes developed for each session, students had the appropriate page in their passport certified. The completed passport entitled a student to receive a certificate of competence in using communication technologies and represented successful entry into the world of electronic classrooms.

Students were divided randomly into groups of 20-25 on the first day and, as a group, engaged in workshop and team building activities for the duration of the five-day programme. The emphasis in workshops was practical experience for students. After a brief description of the evolution of the technology, its scope and use and a demonstration of using the interface and the medium, facilitators guided students into mastering the interface.

## POST-WORKSHOPS EVALUATION

Student evaluation of what they had gained from the programme highlighted three main areas: development of knowledge and basic understanding of communication technologies; increased confidence at interfacing with various media and responses that can be summarised in one student's comment, "realising how I've missed the boat on technology - until now".

The level of interest and enthusiasm shown by students, unanimously, impressed facilitators. One-hour workshops were thought to be appropriate for initiation into some media interfaces (for example, videoconferencing), but too short for others (for example, e-mail and Internet). Suggestions for improving future programmes included presenting a one-hour workshop on day one followed by an advanced workshop on day two for the more complex media interfaces.

## CONCLUSION

Research has shown that interfacing with various communication technologies is a daunting experience for first-year students and so much energy is wasted on mastering the interface that it interferes with the learning process. An orientation programme called a *Passport to Flexible Learning* initiated incoming first-year students into becoming confident users of a range of communication technology interfaces.

Lecturers, experienced in using specific technologies, facilitated the learning of groups of students. Each workshop was structured around a set of competencies and encouraged maximum student participation within a non-threatening environment so that students gained experience and confidence in using information technology interfaces. During the *Passport to Flexible Learning* project students focused on specific interfacing techniques they will subsequently use for academic purposes, thus ensuring that the protocol associated with each interface was clearly understood. Research noted in this paper indicates that for optimum academic performance, students must feel comfortable interacting with the technology.

This paper argued that orientation is an important time for beginning university students and if used creatively, can pay dividends in preparing students for university life. The Passport programme did more than help build the confidence of students in using new technologies. It was central to a quality orientation into university. It gave both purpose and, structure to orientation. It improved on existing programmes by making activities 'hands-on' and 'user friendly' with more action and less talk. By far the most important outcome of the Passport project was that a collective responsibility was taken to make students' entry into university as smooth as possible. Involving academics and general staff from all faculties in the planning and implementation of orientation achieved this.

## REFERENCES

- Anwyl, J., (1996). "The pre-tertiary educational experiences of students". In R. James and C. McInnis (Eds.), *Proceedings of the Second Pacific Rim Conference on the First Year in Higher Education* (pp. 63-72). Centre for the Study of Higher Education: University of Melbourne.
- Ball, C., (1988). "Educational Passports". Paper written for OECD Centre for Educational Research and Innovation. In P. Ellyard (1996). *The pedagogy for a learning culture. Paper presented at the Futures Workshop*, Rockhampton, Australia: Central Queensland University.
- Barnard, J., (1992). "Multi-media and the future of distance learning technology". *Educational-Media-International,* 29 (3), 139-144.
- Burmeister, O. and O'Dwyer, M., (1996). "A university in transition, a virtual learning community". In R. James and C. McInnis (Eds.), *Proceedings of the Second Pacific Rim Conference on the First Year in Higher Education* (pp.103-108). Centre for the Study of Higher Education: University of Melbourne.
- Cuskelly, E., Purnell, K. and Lawrence, G., (1995). *Student Experiences of Distance Education at Central Queensland University: Findings from focus group research.* Rockhampton: DDCE.
- Dearn, J., (1996), "Enhancing the first year experience: Creating a climate for active learning". In R. James and C. McInnis (Eds.*), Proceedings of the Second Pacific Rim Conference on the First Year in Higher Education* (pp. 193-204). Centre for the Study of Higher Education: University of Melbourne.
- Giddens, A., (1987). *Social Theory and Modern Sociology.* Cambridge, U.K.: Polity Press.
- Giddens, A., (1991). *Modernity and Self-Identity.* Stanford, California: Stanford University Press.

- Gilcher, K.W. and Johnstone, S.M., (1988). *A Critical Review of the Use of Audiographic Conferencing Systems by Selected Educational Institutions.* Washington, DC: Annenberg/CPB Project and University of Maryland University College, Office of Instructional Telecommunications.
- Giroux, H. A., (1990). *Curriculum Discourse as Postmodernist Critical Practice.* Geelong: Deakin University Press.
- Hillman, D.C.A., Willis, D.J., and Gunawardena, C. N., (1994). "Learner-interface interaction in distance education: an extension of contemporary models and strategies for practitioners.", *American Journal of Distance Education,* 8 (2), 30-42.
- Hodge, B., (1995). "Monstrous knowledge: Doing PhDs in the new humanities.", *Australian Universities' Review* 38 (2), 35-39.
- Jones, J., Thompson, R., Kindt, I., Winterfield, J., Flanders, M., Seary, K. and Schlotzer, A., (1998). *The interface between learning and technology: A regional perspective.* Action Learning Grant, Central Queensland University, Rockhampton.
- McInnis, C., James, R. and McNaught, C., (1995). *First Year on Campus: Diversity in the Initial Experiences of Australian Undergraduates.* Canberra: AGPS.
- Mizell, A.P. and Carl, D. A., (1994). "Inter-institution co-operation in distance learning", *Technological Horizons in Education*, 21 (10), 91-93.
- National Board of Employment, Education and Training, (1996). "Education and Technology Convergence" *(Commissioned Report No. 43).* Canberra: AGPS.
- Norman, D.A., (1990). "Why interfaces don't work. In B. Laurel", (Ed.), *The Art of Human-computer Interface Design* (pp. 209-219). Reading, MA: Addison-Wesley.
- Peel, M., (1999). "Transition from secondary to tertiary: A performance study.", *Higher Education Series*, Report No. 36, September. Department of Education, Training and Youth Affairs. Canberra: AGPS.
- Rheingold, H., (1990). "An interview with Don Norman". In B. Laurel (Ed.), *The Art of Human-computer Interface Design* (pp. 5-10). Reading, MA: Addison-Wesley.
- Thompson, R., Winterfield, J and Flanders, M., (1996). "Making connections with the world of electronic classrooms: A passport to flexible learning". *Paper presented at the Australian Teacher Education Association 1996 Annual Conference.* Launceston, Tasmania 3-6 July 1996.

TEND 2000

## Crossroads of the New Millennium

# Four Models Of On-Line Teaching

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# Abstract

Central Queensland University (CQU) has been at the forefront of institutions seeking to make "flexible delivery" - that is, the delivery of quality education by means other than simply face-to-face lectures and tutorials - a reality. Rather than by some concerted "grand plan", this effort has been led by various individuals often operating according to ad hoc rules developed as reactions to varying circumstances surrounding the nature of both the particular subject material and the student audience.

Presented here are four models to illustrate the diversity of approaches. All four models are currently in use. No claim is made here to present a "best" model; rather the purpose is to illustrate four different approaches which may be equally valid in different contexts.

The models here described are (1) the naïve model, (2) the standard model, (3) the evolutionary model, and (4) the radical model. Each model is described in terms of its aims and rationale, and the context in which it was developed. The paper also describes for each model the provision of resources, the opportunities for interactivity both between staff and students and amongst groups of students, the capabilities for updating materials and correcting errors, and the methods for accepting and processing items of assessment.

It is to be hoped that practitioners at other institutions seeking to improve their online teaching techniques can adapt various aspects of the models described here so as to provide the best possible learning environments for their students.

# Four Models Of On-Line Teaching

Much has been written in the literature about the forces driving the development of online education (see, for example, Daniel, 1997, Farrell, 1998), about how institutions adapt (see, for example, Ehrmann, 1995, Taylor, 1998), and about the advantages and disadvantages of online over face-to-face teaching (see, for example, Wetzel, Radke, and Stern 1994). It is not the aim of this paper to replicate such arguments here, but rather to present four models of online teaching currently in use within the Faculty of Informatics and Communication at Central Queensland University (CQU), a multi-campus, regional university, with seven campuses in Australia and a further three overseas.

The four models of on-line teaching presented here may be described as the naïve model, the standard model, the evolutionary model and the radical model. All four models rely, to differing degrees, on printed material despatched to the students prior to the commencement of semester, in addition to the online features described here.

No attempt is made in this paper to formally evaluate the different models, nor to judge which model is "best". It is the opinion of all of the current authors that such an evaluation is an extremely complex matter unworthy of simplistic quantitative measures. Whether or not a particular model is appropriate depends upon a variety of factors, of which the following must be included:

i. the type of subject matter: for example, theoretical vs practical, technical vs non-technical, etc.
ii. the competencies and personal preferences of the teacher(s);
iii. the prior experiences of the students;
iv. the expectations of the students with regard to the pedagogical methods to
v. be employed;
vi. the maturity and self-study skills of the students.

Further, whether a subject is deemed to have been taught successfully or not, and to what extent, is extremely difficult to measure. A subject offering which garners a 50% pass rate in one semester using one model, and then a 100% pass rate in the following semester using a different model, may or may not be an indication that the second model is preferable; rather, any number of other factors may have influenced the final results, such as the make-up of the student cohort or the marking guidelines employed.

The next four sections describe the four models, together with some comments on their strengths and weaknesses. The final section summarises the whole, and lists some issues which are still to be addressed.

## THE NAÏVE MODEL

Of the four models described here, the naïve model is probably the most widely-used, particularly for non-computing subjects, but has been widely disparaged throughout the literature. It may be characterised as "putting the lecture notes on the Web". As such, there are no opportunities for interaction or feedback. Often, the notes are such that they are ill-suited for display on the Web, having been originally designed primarily to assist the lecturer(s) provide face-to-face lectures to on-campus students[1].

Jefferies and Hussain (1998) and many others have made the point that using the internet to support learning and teaching requires a culture change for both the teaching staff and the students. It is not surprising, therefore, that this minimalist model is widely-used by those wary of embarking on such a change.

However, despite its minimalism, the model has some advantages which are worthy of note. Firstly, the model is relatively cheap to implement, in terms of both hardware and software resources and staff time. The material can add significantly to printed and other material sent out to students prior to the commencement of the subject. And the material can be altered relatively simply to correct errors and/or add extra information.

Also, this model is the least threatening to students, since communication in strictly one-way, lecturer to student. No skills are expected of the student beyond the ability to browse Web pages using a standard browser. If notes are put on the Web in some other format, such as pdf, then students may need to know how to access the appropriate reader, such as Adobe Acrobat. However, once mastered by the students in one subject, there is relatively little difficulty in using the same products and skills for subsequent subjects.

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[1] In fact the minimalist naïve model as described here is not widely used at CQU; almost all subjects also at least make use of an e-mail list to facilitate communication between students and staff.

The students' time is therefore minimally consumed on mastering the technology, hence leaving maximum time for mastering the subject content, surely a good thing. From the lecturer's point of view, the majority of time and effort can be put into preparing the original material and the lecture notes, also surely a good thing.

Nevertheless, the perceived weaknesses of the naive model, described in much of the literature (eg Taylor, 1998), are such that other more sophisticated models are often to be preferred.

## THE STANDARD MODEL

In contrast to the naïve model, the standard model attempts to actively utilise the advantages provided by the technology to allow a significant degree of communication and interaction between students and staff[2].

Features of the standard model include the following: -

- a subject home page from which links to all of the other resources can be found, updated on a regular basis throughout the semester;
- electronic copies in both html and pdf formats of the printed materials despatched to students prior to the start of semester, including copies of all assignment items;
- lecture slides in Powerpoint format, as used for on-campus classes, made available for browsing or downloading;
- additional notes arising from on-campus lectures and tutorials;
- workshop tasks, with additional notes as appropriate, and solutions;
- assignment marking guidelines and sample solutions;
- links to full contact details, including e-mail addresses and 'phone numbers, of the subject co-ordinators;
- copies of past examinations for the subject and hints and tips for the forthcoming examination;
- links to the electronic mailing list for the subject;
- a list of recent updates and additions, in date order.

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[2] The standard model has been used for a variety subjects, including the Winter, 1999, offering of 85102 Programming B, a subject requiring mastery of both theoretical and practical components (http://www.infocom.cqu.edu.au/Units/win99/85102/). In this offering the feedback barometer (described under the evolutionary model) was also included.

Web pages, and the various links, without knowledge of either HTML or JavaScript. A number of other commercially available tools could also be used to serve a similar purpose.

Students are required to have good access to the 'net, using a browser such as Netscape or Internet Explorer and be able to use e-mail, but otherwise need have no specialised knowledge.

Lecture slides are made available prior to the lectures wherever possible to enable on-campus students to read them prior to the lectures. Any corrections are notified and a new set of slides, if necessary, uploaded.

Perhaps the most significant difference between the naïve model and the standard model is the provision of an electronic mailing list and/or newsgroup, wherein students can communicate easily and effectively both with each other and with the subject co-ordinators. This provides a much-needed source of direct assistance for problems and other queries.

While the standard model may be seen to offer significant advantages over the naïve model, these come at a cost. In particular may be noted the following:

- the increased amount of time necessary to upload various items of information throughout the semester and to ensure currency;
- the increased expectations on the part of many students for online information to be up-to-date at all times (for example, the provision of lecture slides prior to each lecture);
- the increased expectations on the part of many students for online information to be guaranteed error-free (for example, the solutions to workshop tasks and assignment items);
- the significant additional workload imposed by the need to respond to newsgroup postings on a prompt and regular basis.

## THE EVOLUTIONARY MODEL

Although the standard model uses the online technology to some advantage, other problems, such as how to identify and remedy any shortcomings in the content and/or delivery of previous offerings of the subject, remain. Another important issue is that of equity between different student groups; off-campus students often believe they are at a significant disadvantage for many reasons, which include:

- the lack of access to the on-campus lectures and tutorial sessions;
- the difficulty of access to other resources, such as staff members' time, library stocks, etc.;
- the delays caused by the physical transmission of assignments and other subject resources;
- the expense of connecting to the Web for long periods.
- A discussion of these and other problems can be found in (Jones, 1996b).

The evolutionary attempts to address these issues[3]. While the exact method of delivery "evolves" from semester to semester based upon identified strengths and weaknesses, amongst the aspects which normally distinguish the evolutionary model from the standard model are:

- a mirror of the Web site, as it pertains at the beginning of semester, is placed on CD-ROM and delivered to the students alongside the printed material;
- lectures are audio pre-recorded and available both on the CD and from the Web;
- animations are used to explain many of the concepts;
- 'live' lectures are given only in response to student requests for further explanation of particular topics. If no requests are forthcoming in a particular week, no lecture is provided;
- web-based archives of mailing list discussions from previous semesters are made available;
- assignments are submitted, recorded, marked, and returned electronically;
- a large number of small assignments are set; however, only a subset of the assignment tasks are actually marked and used for grading purposes
- a feedback barometer is provided, through which students are enabled to provide anonymous feedback as to how the subject is progressing on a weekly basis (Svensson et al, 1999).

Some points arising from the above are worthy of note. Although the printed materials may seem redundant (since the same material appears on the CD), students generally prefer the hard-copy, and quality control is ensured. The provision of a CD does, however, enable students to dramatically reduce the time spent online.

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[3] The approach described here has been used in many subjects including 85349 Operating Systems in Winter, 1999, (http://www.infocom.cqu.edu.au/Units/win99/85349/). Details of the evolutionary model can be found in (Jones, 1996a) and (Jones, 1999a).

Presenting the lectures on the CD means that the lectures must be prepared in advance of the start of semester. They can be recorded either from lectures given as part of a "normal" offering, for use in subsequent semesters, or specially recorded for the purpose.

The provision of supplementary live lectures only "on demand" is an attempt to both reduce the costs associated with the delivery and provide equity to all students, while, at the same time, not denying on-campus students the opportunity for face-to-face lectures as and when the need arises. Issues arising out from such lectures are added to the Web for the benefit of other students.

The setting of a large number of small assessment items ensures that students cover the material in a reasonable fashion, rather than attempting to cram just prior to the examination; the use of only a subset for grading purposes reduces the workload on academic staff.

The online submission system (Jones and Jamieson, 1997) not only treats both on-campus and off-campus students in an equitable fashion but greatly reduces problems caused by late or non-delivery via conventional mail systems. The marking and recording of assignments is also greatly simplified and the process made less prone to human error. Also, electronic submission enables a range of checks to be made to identify plagiarism or unreferenced sources. However, the greatest advantage is the possibility of a much faster turnaround time; typically, reduced from an average of two weeks for paper-based submissions to three working days for online submissions.

The feedback barometer is an interesting mechanism enabling students to provide anonymous feedback on a weekly basis. While it may be natural for some staff to feel concerned that this may encourage unduly negative comments, our experience has been the reverse, in that the comments have, if anything, been rather more positive than might have been expected. Nevertheless, it provides a good mechanism whereby any problems with the subject may be identified in a non-threatening fashion and hence corrected in future offerings.

## THE RADICAL MODEL

Whereas all three previous models have attempted, to differing extents, to adapt the traditional face-to-face lecture delivery method to a more suitable online format, the radical model dispenses with lectures entirely. Instead, students are formed into groups and learn by interacting amongst themselves and using the vast amount of existing Web-based resources, with the academic staff member(s) providing guidance as and when required[4].

Distinguishing features of the radical model include:

- a video sent out to all students prior to the commencement of semester explaining the "way the subject works";
- minimal traditional instruction from the academic staff; instead, students are expected to use the set text and make extensive use of search engines and other facilities to seek out resources available on the Web;
- compulsory use of the subject mailing list for communication;
- lectures are replaced by online electronic presentations prepared by the students themselves, each based on the topic for that week;
- students are allocated into groups, each of which is responsible not only for providing an electronic presentation at some point during the semester, but also for responding critically to all other such presentations.

The online student presentations are expected to highlight the main points of that week's topic, to explain and, where necessary, defend these points and to suggest issues for further thought that will engage the rest of the students in a critical analysis and discussion of the presentation. A one-page summary, which can be in the form of a formal abstract, precedes the presentation, followed by a well-argued analysis/critique extending over two further pages (screens). Students are welcome to use additional sources and links as required.

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[4] Such a model has been used successfully in the subjects 21608 Information Systems (http://www.infocom.cqu.edu.au/Units/win99/21608/) and 95367 Electronic Commerce in both 1998 and 1999 (http://www.infocom.cqu.edu.au/Units/win99/95367/), all undergraduate subjects. A detailed description of the radical model can be found in (Romm and Taylor 2000).

Students are assessed not just for their group presentation but also for their comments about other presentations. Each group presentation is also assessed on the quality of the discussion that follows; for this reason, it is important to the students that their electronic presentations are well-crafted, thought provoking, and intriguing. Typically, by the end of semester, students will have received over 100 inputs on their work from other students in the group, other groups and the lecturer.

Different assessment criteria may be used – for example, for the electronic presentation, clarity and structure of presentation, originality of ideas and ability to substantiate arguments by relevant data; for other contributions, understanding the arguments that are made by other presenters, linking them to the relevant literature, and making pertinent critical comments about these arguments.

In the last week of term, students are invited to submit a recommendation in writing on each other's group performance. The lecturer considers the group's recommendations when allocating individual marks for group performance to members of the group. A student that a group decides did not contribute sufficiently may as a result suffer a reduction in mark.

The students' final marks are based on a combination of their group work throughout the semester and their performance in a closed-book end-of-semester examination.

Amongst many real advantages of the radical model may be listed the emphasis on group-work, the need to use real-world skills both for effective communication and research and the significantly lower demands on staff time than with most other models. However, students need to adapt early to the demands of the model (the first presentations are made as early as week three or four of the semester), and the model is perhaps more appropriate for postgraduate and later-year undergraduate students rather than recent school-leavers.

## CONCLUSION

Four different models of online teaching have been presented, all in current use. Advantages of the naïve model include its relative simplicity and economy in terms of staff time. Advantages of the standard model include better access to resources for students, and opportunities for greater interaction; disadvantages include the amount of staff time needed to facilitate both on-campus and off-campus delivery effectively. The evolutionary model attempts to provide one delivery mode to all students, with online submission of assignment items, but marking of only a sample; it therefore attempts to provide a quality education without the associated high costs. The radical model dispenses with traditional teaching almost entirely and places the emphasis on the students themselves to learn within a group setting, using the Web for resource material and newsgroups for communication and presentation of assessment items, with the lecturer providing guidance and feedback as required.

The experiences of the current authors would tend to indicate that each of the approaches described here can be perfectly valid, but that, for best results, it is of vital importance that the students be made fully aware from the commencement of the subject as to the model to be employed and the inherent limitations. Thus, the naïve model might be frowned upon by students expecting a high degree of online interaction, while the radical model might be frowned upon by those expecting a more traditional lecture-style presentation; in such cases it is perhaps the expectations, rather than the model, which might profitably be changed.

As a final point, we note that as universities worldwide face up to increasing competition, the development of models which facilitate quality online education while keeping costs to a minimum is likely to be vital to the very survival of those institutions. It is to be fervently hoped therefore that greater encouragement for such experimentation and development will be forthcoming. In the meantime it is anticipated that all four models described here will continue to be refined, and doubtless others developed, as a result largely of individual efforts.

## REFERENCES

- Daniel J S, (1997). Why Universities Need Technology Strategies, *Change 29(4):* pp10-16.
- Ehrmann S C, (1995). Asking the Right Questions: What Does Research Tell Us About Technology and Higher Learning?, *Change 27(March/April):* pp 20-27
- Farrell Glen M, ed., (1999). *The Development of Virtual Education: a global perspective*, Commonwealth of Learning, Vancouver, Canada.
- Jefferies P and Hussain F, (1998). Using the Internet as a Teaching Resource, *Education and Training 40(8):* pp359-365.
- Jones D, (1996a). "Solving Some Problems of University Education: A Case Study", in Debreceny R and Ellis A (eds), *Proceedings of AusWeb'96*, pp243-252, Lismore, NSW.

- Jones D, (1996b). "Computing by Distance Education: Problems and Solutions", *Proceedings of the First Integrating Technology into Computer Science Education Conference,* pp 139-146, Association for Computing Machinery, Barcelona, Spain.
- Jones D, (1999a). "Solving Some Problems of University Education, Part II: A Case Study", in *Proceedings of AusWeb'99*, Balina, NSW.
- Jones D, (1999b). "Webfuse: An Integrated, Eclectic Web Authoring Tool", in Collis B and Oliver R (eds). *Proceedings of EdMedia'99,* pp1799-1800, Seattle, Washington.
- Jones D and Jamieson B, (1997). "Three Generations of Online Assignment Management", in R. Kevill, R. Oliver and R. Phillips (Eds.*), What Works and Why, Proceedings of ASCILITE'97*, pp 317-323.
- McCormack C and Jones D, (1997). *Building a Web-based Education System*, John Wiley and Sons.
- Romm C T and Taylor W, (2000). *Thinking Creatively About On-line Education*, IRMA, Anchorage, Alaska (forthcoming).
- Svensson L, Andersson R, Gadd M, and Johnson A, (1999). "Course-Barometer: Compensating for the Loss of Informal Feedback in Distance Education", in Collis B and Oliver R (eds), *Proceedings of EdMedia '99,* pp 1612-1613, Seattle, Washington..
- Taylor P, (1998). "Institutional Change in Uncertain Times: Lone Ranging is not Enough", in *Studies in Higher Education*, 23(3), pp269-278.
- Wetzel C D, Radtke P H, and Stern H W, (1994). *Instructional Effectiveness of Video Media*, Lawrence Earlbaum Associates, New Jersey.

TEND 2000

# Crossroads of the New Millennium

# Engineering Education For Leadership In The 21st Century

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## Workshop 2

# Abstract

The 21st Century will be one of intense globalisation of commerce, further strengthening of the "information society", major innovations in technology, sustainable development, gender equality and life long learning. Innovation through engineering and global commercialisation of such innovations will be the key to the prosperity of nations.

Engineering today is the design of safe, practical and economical solutions to complex technological problems. In Canada and many other countries, it is a "regulated" profession that operates through a code of ethics. The high level of our civilization is very much due to engineering advances. The next century must see engineers play a leadership role not only as problem solvers and innovators, but also in international commerce, public policy and public leadership.

Engineering as a subject area is the "new liberal arts". Today, a basic degree in engineering easily qualifies one to pursue further studies in commerce, medicine, law and many other fields. The converse in not true.

Engineering education in the next century will provide much more than scientific, mathematical, technical, information technology and design knowledge and skills. The men and women who will be 21st Century engineers will exhibit leadership and multi-disciplinary teamwork, and have a clear understanding of the history of science and of sustainable development. They will be multilingual and excellent communicators. They will have a background in commercialisation and start-up of enterprises. They will be trained to be life long learners. They must be ethical and highly disciplined individuals who will be an example to other sectors of society.

The rapidly developing engineering curriculum at the University of Calgary is designed to produce the 21st Century engineer.

The 21st Century will see engineers assume a more prominent role, not only as innovators and technological guardians of the knowledge-based society, but also in international commerce and leadership of successful nations.

## THE 21$^{ST}$ CENTURY

The engineering profession and, consequently, the education process for engineers, must respond to several new realities in order to be successful in the 21$^{st}$ Century. Programmes of engineering education that respond to the new reality will expand and be successful while others will necessarily shrink. Some aspects of the new reality that are relevant to engineering education are briefly discussed in this section.

## GLOBALISATION OF COMMERCE

The globalisation of commerce essentially means more opportunities globally for economic activity, including engineering services, as well as more competition. This is caused by the "free trade" movement, ability to communicate more or less instantaneously and emergence of English as the world language for business and science.

## INFORMATION REVOLUTION

We are privileged to be at the inception of the information revolution. We have the ability to store large knowledge and databases and to access them worldwide through the internet and the web. Further, advanced high speed computing capability is available at one's fingertips. The information highway leads not only to abstract information but also to people at dispersed locations. High-speed real time video conferencing and web based communication makes one's location in the world essentially irrelevant with respect to conducting business, engineering or educational activities.

## INNOVATIONS IN TECHNOLOGY

The rapid progress made by humankind in the last few centuries, and indeed millennia, is due in significant part to innovation through engineering. From the pyramids of Egypt, to the massive irrigation systems of Sri Lanka, to the highways and aqueducts of the Romans, to the industrial revolution originating in Europe and the current North American lead information revolution, it is innovation through engineering that has led the way. The 21$^{st}$ Century will clearly see an acceleration of the process with information and telecommunications technology, nanotechnology, environmentally friendly advanced manufacturing, bioengineering, software engineering and space engineering being some of the technologies at the forefront.

We must also deal with "technologiefeindlichkleit" which means essentially…"mistrust of technology". This is faced not only by engineering but by other technologies such as pharmaceuticals and genetics. The engineering industry as well as educators must explicitly take society's mistrust of technology into account in our planing. This mistrust is caused in part by past errors by the profession and industry. It can only be ameliorated by a sustained long term effort to keep in mind the overall social good and the need for sustainable development when undertaking engineering projects.

## SUSTAINABLE DEVELOPMENT

The understanding that we must … "meet the needs and aspirations of our generation without jeopardizing the needs and aspirations of future human generations and the well being of other species", i.e. practice sustainable development, is, taking hold. Consequently, engineering must be redefined as the harnessing of nature and knowledge for the benefit of all species and generations. Engineering for the environment is therefore, not only cleaning up the mistakes of the past, but also ensuring that, in future, manufacturing will be based on clean technologies and life cycle management.

## LIFELONG LEARNING

Given the rapid rate at which technology is advancing and new information is becoming available, it is clear that one does not "stop learning" when one obtains a parchment and joins the workforce. Continuous upgrading of one's skills, abilities and knowledge is essential to being successful as an individual or as a company. Not only the recipients of learning, but the providers of learning, must adjust to this need for continuous education. It is obvious that a major mode for continuous learning will be the WWW. However, the inherent desire to learn directly from a knowledgeable human being will not disappear.

## GENDER EQUALITY

Gender Equality is another new reality of the modern age. The engineering profession has been slower to recognise this fact in comparison to other professions such as medicine and law. The obvious fact, that the talents and the genius of half the population has not been available to the profession in the past, must be recognised and remedied rapidly for the good of society as a whole. Canada is a world leader in striving for true gender balance in engineering and engineering education.

## PROSPERITY OF NATIONS – FUTURE ROLE OF ENGINEERS

The prosperity of nations will depend in the long run on their ability to succeed in the new knowledge based world economy. Innovation through engineering, the ability to create knowledge based products and services, and the ability to trade such products worldwide will be key. Highly educated human resources that generate the knowledge required, that also have a high degree of innovation and entrepreneurship, will be required.

The ability to create knowledge, to be innovative and entrepreneurial is an intrinsic human characteristic. However, one must have the right political, economic and cultural climate that enables these latent characteristics to flourish. Democracy, a free judiciary, a free market, equal treatment of all people, an efficient education system and honesty are some of the key conditions.

## POLITICAL LEADERSHIP

The political leadership in many countries is weak and rampant with corruption and nepotism. They are unable to set up public policies that help to produce prosperity for all their peoples in the 21st Century. One of the keys to unlocking this problem is for engineers and other professionals, who follow clear codes of ethics [APEGGA (2000)], to be more active in setting and enacting public policies. This means assuming roles of political leadership as opposed to being simply technocrats.

## MULTI-NATIONALS

Multi-national and large corporations are another artifact of the global economy. They too must be flexible, innovative and remain entrepreneurial and have a long-term vision to succeed. They are also highly influential. Enlightened leadership that looks beyond the short term "bottom line" is critical for such corporations. Engineers must aspire to such leadership roles in large corporations.

## NEW START-UPS

Equally important, if not more so, in the new century, are "start up" companies that are knowledge based. Since innovation through engineering is key to such start-ups, engineers must have the entrepreneurial ability to meaningfully take their innovations to the market place.

## ENGINEERING – THE NEW LIBERAL ARTS

The study of engineering is well on its way to becoming the "new liberal-arts" of the 21st Century. In particular, in Canada, the engineering curriculum includes the study of mathematics, basic sciences, engineering science and engineering design. Further, the study of the relationship between engineering and society, safety, ethics, communications and complementary studies (typically traditional liberal arts courses) is mandatory [CEAB (1999)]. Such a broad-based curriculum is what a 'liberal-arts' programme is supposed to be. Indeed, according to Winchester (1996) the original liberal arts of a few centuries ago had certain similarities to today's engineering curriculum.

Today, many that graduate with a bachelor's degree in engineering pursue further studies in business, law, and medicine and other fields. In fact, it is well accepted that they excel in such programmes. However, very few play major roles in the development of public policy or take on leadership positions, either of large corporations or nations.

The "New Engineering" curricula for the 21st Century must improve upon the successful curricula of the last few decades.

## BASIC ENGINEERING/SPECIALISATION

The "New Engineering" must respond to the new reality. The major responsibility in this regard lies with educational institutions. Strong basic engineering skills must be given to all engineers to ensure their adaptability in a rapidly changing world. At the same time, the explosive growth of knowledge and requirements of industry point towards increasing specialisation. Some examples are: Software Engineering, Intelligent Manufacturing, Bio Engineering, Generalised Positioning Systems (GPS) and Urban Systems Engineering. Engineering education must respond to the competing need for basic engineering skills and for specialisation.

## INDUSTRY/UNIVERSITY PARTNERSHIP

Efficiency requires that industry and universities form partnerships to provide life long engineering education. This does not mean that universities will simply provide only for industrial needs. Students must be imbued with the greater responsibility to society as a whole and to sustainable development, during the educational process. Industry in turn must pick up some of the support withdrawn by governments by providing in-kind services such as teaching portions of courses and by supporting "experiential learning" through internship programmes. Further, the need to be competitive implies that large-scale engineering and research projects require not only multidisciplinary teams but also university and industry working together.

## INNOVATION/ENTREPRENEURSHIP

The ability to innovate through engineering is an essential aspect of being competitive in the global village. For example, this realisation has caused an "innovation offensive" in Germany. New Engineering education consequently is not simply technical education but the training of engineers to innovate and to be entrepreneurial. It has even been suggested that the term "engineer" be changed to "technovator".

## COMMUNICATIONS

As engineering problems become more complex, the technical tools for their solution also become increasingly sophisticated. It is demonstrated regularly that engineers are up to the challenge of developing the technical solutions. However, defining some of the major engineering problems on a larger scale requires significant public consultation, i.e. two-way communications. Communicating complex solutions and in some cases obtaining public "buy-in" is equally important. The engineering culture of working with computers and using a highly analytical approach does not facilitate clear communication with others. Even within corporations, engineers must communicate more to support and advance their ideas and proposals. To emerge from the "back-rooms", engineers must be brought-up in a culture of teamwork, collaboration and constant clear communication. The new engineering curricula must reflect that imperative.

## COMPLEMENTARY STUDIES

An understanding of history, the political process, psychology and social anthropology for example is important in formulating public policy and assuming leadership roles. Room must be found in the 21st Century Engineering curriculum for such studies.

## BIOLOGY

Sustainable development is obviously related to humans and other species, both plant and animal. The development of "sustainable" solutions to major engineering problems, indeed the comprehension of what the problems are in the broader context, requires an understanding of biological system. It is a worldwide phenomenon that, in the last century, students planning to study engineering were discouraged from studying biology at the secondary school level. That lack of knowledge has lead to the development of environmentally "unfriendly" and non-sustainable engineering projects and a resulting increase in "technologiefenidlichkleit". We must work with the secondary school systems and our own curricula to provide a better understanding of biological systems to those entering the engineering profession.

## WOMEN IN ENGINEERING

Given that slightly more than half the population consists of women, the engineering profession would stand to lose unless it attracts significant numbers of women. Society as a whole would lose if the brainpower of that population were lost to a key profession on which we depend for our safety and for technological innovations. The University of Calgary has been a leader in promoting gender equality in engineering. It was the first to establish a women in engineering standing committee with a mandate to improve the quality of the experience of women in engineering education, to encourage further education, e.g. from Masters to PhD level, and to attract increasing numbers. We have also been pro-active in attracting and recruiting women faculty and now have the largest cohort in Canada of 12 faculty members. The function of faculty members to be "role models" for women students cannot be underestimated. We have also established the NSERC/PetroCanada Prairie Region Chair in Women in Engineering and Science to investigate all aspects of the role of women in science and engineering.

## THE UNIVERSITY OF CALGARY APPROACH (www.eng.ucalgary.ca)

One must balance the competing requirements that are to be accommodated within a curriculum with the cost, to students and society, of the educational process. The University of Calgary position is that, given the level of high school education in Canada, a four year university programme in engineering is reasonable for producing graduates that either enter the workforce as "engineers-in-training" or go on to higher studies in engineering (Masters, Ph.D.), or further studies in business (MBA), law or medicine. However, an additional 16 month internship in industry (May xx to August xx + 1) amounting to a 5 year programme, is highly encouraged for those who wish to become "superior graduates" with the opportunity to obtain the plum employment opportunities and advance rapidly into leadership roles.

## A PROGRAMME FOR THE 21$^{ST}$ CENTURY

Nine degree programmes are offered, a balance of the four traditional "pillars" of engineering: Chemical, Civil, Electrical and Mechanical Engineering, with five more programmes appropriate for the modern economy: geomatics, manufacturing, oil and gas, computer and software engineering. Several "minor" specialisations (options) are offered within certain programmes thus maintaining the tension between basic and specialized knowledge: environmental, transportation, structures (civil engineering), petroleum (chemical and mechanical engineering), computer integrated manufacturing (mechanical engineering).

A degree in General Engineering with special emphasis on engineering science and team based engineering design, as well as significant liberal arts, history of science, communication and second languages content, is being planned. It will also have a mandatory research thesis as well as a specialisation in fourth year on an advanced topic, e.g. nanotechnology. Tentatively titled the "Galileo Programme" the degree will be open, through an entrance examination, to a small cohort (say 50) of the best students worldwide.

Minor specialisations in bioengineering (in civil, chemical, electrical, mechanical, geomatics) and mechatronics (mechanical) are at the advanced planning stage. We see bioengineering as a growth specialisation area within many of the main branches of engineering at the undergraduate level, and as a freestanding programme at the postgraduate level.

## ENGINEERING INTERNSHIP

Engineering Internship is a flagship programme of experiential learning of 16 months duration that is "sandwiched" between the third and fourth year regular academic programmes. Industry gains access to students with three years of engineering studies who can be expected to undertake a challenging work experience. The duration of the placement allows corporations to have a reasonable expectation of accomplishing a completed project. The interns thrive in the situation where they are challenged, and also spend sufficient time at a corporation to understand corporate culture, communications as well as take advantage of networking opportunities. The key to the success of the internship concept is the ability to provide a meaningful advanced and sustained work experience over 16 months. Additionally, students obtain exposure to other companies by doing four-month "summer" jobs after the first and second regular academic years respectively. With only one work placement per student, internship is also very cost effective to operate. We expect participation in internship to stabilize at about 75% with the remaining 25% being students planning for further studies in engineering, business, law or medicine. We expect students graduating with internship to play significant leadership roles in industry in future.

## DOUBLE DEGREE PROGRAMMES

Five year double degree programmes are available with the humanities, social sciences and fine arts, leading to an extremely broad and well-rounded education. The graduates from the humanities and social sciences double degrees are ideally suited and well positioned to play roles in developing public policy and even assume political leadership roles in the future. The study of a second language, through a double degree in the humanities, will facilitate international business opportunities.

## ENTREPRENEURSHIP and ENTERPRISE DEVELOPMENT

In support of the philosophy of encouraging engineers to innovate and then incorporate "start-up s", a minor specialisation in entrepreneurship and enterprise development is available to engineering students, in co-operation with the Faculty of Management. The programme requires six additional months of study, which can be accomplished by taking spring/summer courses, or by stretching the four-year degree by another academic term. The minor is also intended to help students who join smaller firms in playing more than a technical role.

## SPECIAL ADMISSION REQUIREMENTS

Typically, students planning to take engineering do not pursue studies in biology in secondary school. Such studies are important in understanding sustainable development and for further studies in, for example, environmental and bioengineering. The University of Calgary has an admission policy that allows us to admit students who have opted for biology over calculus, with the promise that they follow a special programme in first year, that includes catch up courses in calculus.

## CONCLUSION

The 21st Century engineering curriculum is designed to provide the right education for students planning a variety of career paths. It allows a reasonable degree of specialisation within a basic degree. It positions students for further studies in engineering, law, medicine, and business. Degree programmes ranging from traditional to post-modern (e.g. software engineering) is available. Internship programmes allow for a significant industry experience, both technical and otherwise, that enables us to produce "superior graduates" suitable for leadership positions.

The 5 year double degree programmes provide a broader education befitting those aiming for a career that includes leadership not only of corporations but roles in formulating and providing leadership in public policy. An extra degree minor provides a learning experience in entrepreneurship and enterprise development for those planning to start up a business or join a small corporation.

With such a curriculum, engineering can emerge as the "new liberal arts" programme that produces engineering, corporate and national leaders for the 21st Century.

## ACKNOWLEDGEMENTS

The many innovative academic programmes of the Faculty of Engineering were planned and designed by enlightened academic staff members. This paper builds further on a previous paper titled "Challenges and Opportunities in Engineering Education".

## REFERENCES

- Edmonton, Alberta, (2000). *APEGGA, The APEGGA Code of Ethic,* Association of Professional Engineers, Geologists and Geophysicists of Alberta, Canada, 2 p.
- Ottawa, (1999). CEAB, *Accreditation Criteria and Procedures,* Canadian Engineering Accreditation Board, Canadian Council of Professional Engineers, Ontario, 32 p.
- Winchester, I., (1996). *Engineering as a Liberal Art,* Deans Series on Engineering Education, Faculty of Engineering, University of Calgary, Calgary, Alberta, 5 p.
- Wirasinghe, S.C., (1995). *Challenges and Opportunities in Engineering Education,* Proceedings of the International Congress of Engineering and Industry Leaders, USICEE, Monash University, Clayton, Victoria, Australia.

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Crossroads of the New Millennium

# The Tertiary Awareness Programme Pilot - Transition From Secondary School To University, An Australian Experience In Student Transition.

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Workshop 2

# Abstract

For many years now the problems associated with student transition from high school to university have been the subject of various reviews and investigations (OECD, 1977), (Anderson, 1980), (ACER, 1982). Problems experienced by students range from simple economic factors to personal factors including loss of confidence and in some cases, complete or partial withdrawal from the university course initially chosen (Gose, 1995), (Beder, 1997). Many institutions have studied these transition related problems and various solutions have been both proposed and in some cases, implemented with varying degrees of success, (McInnis and James, 1995), (DEETYA, 1999).

The "transition" problem has been the subject of a range of treatments from most stakeholders, from a variety of philosophical and pedagological perspectives. Most studies recognise that to aid effective transition, all stakeholders should have a clear understanding of their specific roles within this process (DEETYA, 1999), but often these roles are not well understood by those involved. Many tertiary institutions, worldwide, offer a variety of preparation, bridging, access, orientation and/or foundation courses (White, 1998). Many of these courses are designed to assist in the transition process while others are more focused on some specific skills development or pre-qualification concept.

Recognising that a proactive step was required, a pilot transition programmeme was developed, administered and presented following a strategic alliance between the Queensland Education Department (Glenmore State High School) and the regional university (Central Queensland University). The pilot programmeme was operational between 22 April, 1998, to 23 July, 1998, and involved students and staff from the Glenmore SHS and staff from the Faculty of Business and Law at Central Queensland University.

Unlike most previous transition-type courses, this pilot programme relied heavily on a process of acculturation and socialisation, in conjunction with the delivery of a variety of traditional learning and student-centred life skills. This paper examines the pilot programmeme, describes its development, delivery and outcomes, which appear to have important implications for secondary and tertiary sector educators.

# The Tertiary Awareness Programme Pilot- Transition from Secondary School to University, an Australian Experience in Student Transition.

## INTRODUCTION

The process of "transition" occurs at various key stages throughout a person's life. The sequential progression of children through the formal primary and secondary education systems has attracted a good deal of research over the years (Power and Cotterell, 1981). These transition periods typically occur within the context of a structured family environment of some description. Perhaps one of the first transition periods that breaks away from this ordinarily supportive environment, is when senior high school students (Year 12) are preparing to undertake tertiary study or join the workforce.

It is during this period that students start to realise that their lives are changing. They become aware that, as individuals, they may have to make their own way in the world. Not all students have to fend for themselves outside the family structure at this time. Regardless of the individual circumstances of students, for many intending to commence tertiary study, one of the major areas of anxiety is the uncertainty of university life. These uncertainties often include:

- questions as to why they might be attending university,
- confusion regarding conflicting advice from parents, guidance officers and other careers advisers,
- the uncertainty of the potential long term benefits that accrue from tertiary education,
- concerns about gaining access to their desired course of study,
- apprehension regarding living away from home and family,
- the difficulty of establishing new friendships,
- the economics of being a student,
- choices about which institution and at what level to study,
- about the differences in teaching and learning between high school and university,
- trepidation about the differences in assessment methods and standards,
- a fear of failure.

(McInnis and James, 1995), (Peel, 1998), (White, 1998).

Failure to adjust to university life can have severe consequences. In many cases this can lead to the partial or complete withdrawal by the student from the university course initially chosen (Gose, 1995), (Beder, 1997). In Australia, one-third of all new students consider withdrawal in the first year (McInnis and James, 1995).

Many other problems have also been identified, including the expectations of students entering university. For example, approximately 45% of students in the Committee for Advancement of University Teaching survey reported that the standard of the work expected at university was much higher than they had expected and most found that university was more demanding than school (McInnis and James, 1995).

That same report indicated that approximately 33% of students who had been surveyed thought that their high-school schooling had provided them with a "very good preparation" for their university study. This indicates that the greater majority of students felt that they had something less than good preparation. This supports the proposition that the preparatory work in high school was well below the level required for smooth transition into tertiary study. This is hardly surprising as it has been reported that schools "universally saw their primary role as being to get their students through the Victorian Certificate of Education and attain the maximum possible Tertiary Entrance Rank" (Macdonald, Litchfield, and Litchfield, 1998).

The Tertiary Entrance Rank (TER) has since been modified to meet national university entrance standards and is now known as Equivalent National Tertiary Entrance Rank (ENTER). This is the ranking given to all students completing year 12 of high school and is the measure by which Australian students are selected for tertiary courses.

A content analysis of transition courses, (including foundation supplementary, access, link, orientation, introductory, bridging, and preparatory) offered throughout Australian universities (White, McGuire, Farrell and Farrell, 1998), revealed limited courses which included experience of 'acculturation' adjustment from high school to university life.

The concept of a Tertiary Awareness Programme Pilot (TAPP) was initiated by a university lecturer, who was experienced in the tertiary education system (Kent Farrell), and a high school deputy principal (Wendy Farrell), who was familiar with the concerns and anxieties of senior students preparing for their adult lives and, in particular, students going on to tertiary study. This was supported by the practical experiences shared between local professional educators (both secondary and tertiary sectors). A transition programmeme rationale was formulated around the concerns of high school students and first-year university students. This led to the establishment of a working party with appropriate stakeholder representation.

Stakeholders from the following areas were identified:

- High school students
- Undergraduate students
- Parents of the two cohorts
- Secondary education professionals
- Tertiary education professionals
- Central Queensland University
- Education Queensland (Glenmore SHS)

This group represented the major interest groups who were directly involved in this project and provided support, resources and guidance for the project.

## PROGRAMME RATIONALE

The rationale underpinning the Tertiary Awareness Programme Pilot is that first year undergraduate students, who have recently left the high school education system, can experience difficulty in adjusting to university life. This adjustment includes the substantial differences in teaching/learning styles between high school education and university education (El-Khawas, Hoffert, Skilbeck, and Wagner, 1997), as well as the social implications of this transition, (Peel, 1998), (Kantanis, 1998). This comment acknowledges that a small proportion of students are well prepared for the transition to tertiary study.

Fundamental in the formulation of the rationale and development for the programme was the integration of the following aspects of transition;

- academic,
- social,
- economic,
- environmental.

These four areas have since been highlighted in more recent transition research undertaken by independent researchers (Kantanis, 1998). The emphasis in the pilot programme was the fusion of two of these areas, the social and academic aspects of transition. Economic and environmental issues were also included in the initial framework of the course. A working party was formed (from the stakeholder group) and set about the development, resourcing and administration of the programme.

## PROGRAMME DEVELOPMENT

Mr Farrell negotiated the funding for the project and, with funds drawn from the Glenmore SHS, the Faculty of Business and Law as well as the School of Marketing and Tourism, appointed Ms Tina White as the course co-ordinator. The first task to be undertaken was to formulate clear objectives for the operation of the programme.

Accordingly, the working party developed a set of primary objectives for the pilot programme, formulated around the existing literature and previous research that had been conducted in this field. These objectives were:

- to equip senior students with appropriate skills to assist in their transition from high school to tertiary study;
- to provide senior students with appropriate experiences of undergraduate study;
- to promote awareness of job-personality match and subsequent links to qualifications required and courses available;
- to provide senior students with a decision criteria for deciding on options regarding courses, universities, career prospects, professional memberships and so on.;
- to provide senior students with appropriate learning skills that will assist in their transition to university and other further study;
- to provide senior students with learning skills that are complementary and can be utilised in their senior year of secondary schooling;
- to provide senior students with confidence in dealing with the university administration and support bodies (eg CQU library);
- to assist senior students to develop a network of contacts within CQU and associated stake holders.

The primary aim of the TAPP was to encourage the development of appropriate life long learning skills of senior high school students who were preparing for first year at university. In addition, it was predicted that these same students would find this programme helpful in completing final year studies at high school. In this sense, the programme was informative, complementary and innovative and was clearly focused on the "transition" process.

However, in the pre-course development stage (see section headed pre-course development below) of the TAPP, it was determined (from initial interviews with students) that students were concerned with numerous other issues outside the scope of a study skills course Specifically, those discussions highlighted the need for accurate and timely information that would help students to establish decision criteria for selecting an appropriate tertiary course, and institution, as well as addressing issues of acculturation and socialisation into the university environment.

To this end the objectives were extended and modified to encompass the suitable preparation of high-school students for university life, including the development of independent life long learning skills, socialisation experiences, acculturation experiences and provision of accurate and up-to-date information regarding university life as a student.

## PRE-COURSE DEVELOPMENT.

This stage of the programme saw a number of parallel activities being undertaken. These included:

- Literature review and synthesis (including a content analysis of similar national and international programmes);
- Selection of student cohort;
- Ethical clearance (most students were under 18 years of age and this required parental consent in addition to individual consent);
- Detailed discussions with stakeholders (including high school faculty staff and university faculty staff);
- Review of programme objectives;
- Development of course materials (including unit profile and assessment items);
- Resource allocation (teaching space, course materials, timetabling, transport etc.);
- Advertising and promotional material (both internal and external).

## SELECTION OF STUDENT COHORT.

As Glenmore State High School was represented on the working party and Mrs Farrell was involved in the development of suitable programme objectives, it was decided to use the year 12-student cohort of that school, for the pilot study. Student participation in the programme was determined by targeting high school students who had self-identified possible tertiary pathways or who may have been considering tertiary study. These students were offered an opportunity to take part in the pilot programme. In total, 27 students participated and completed the pilot programme, from an original 30 students.

## COURSE DEVELOPMENT

- Recognising the importance of the role of the high school teachers in bridging the gap between the secondary and tertiary education environments, a number of high school teachers who regularly interacted with senior students were also consulted for input into the programme. In addition, the District Director of Education (Education Queensland) and the High School principal were consulted and expressed their active support for the programme. At the same time, senior university staff and academics were advised of the programme and invited to participate. The concept of the programme was well received by all concerned.

- Additionally, it was decided that a benchmarking project relating to this activity would be useful for programme evaluation and further research. A Group Support System (GSS) approach was used to collect data. This was accomplished using a Grouputer hardware/software combination (Farrell, Whymark and Farrell, 2000). Interested readers wanting more details on this process will find a comprehensive review of this methodology in the aforementioned working paper.

A series of questions were developed in an effort to position the existing knowledge of the student cohort in such a way that any changes to their individual levels of knowledge could be readily observed. Investigations were made into student perceptions and opinions of several issues relating to university and tertiary education in a general sense. These questions were trialled on a small sample (not part of the pilot cohort) and modifications were made following student responses. Subsequent to this pre-test, a final agenda of 16 questions was developed and administered to the pilot cohort. For this activity students were paired and data was collected.

## UNEXPECTED FINDINGS.

While there were many interesting findings from this small group, several issues were immediately highlighted. For example, when asked about the economics of being a student (how much might their weekly food bill total) some respondents indicated that they would budget A$10.00 (US$6.20) per week. Students were asked their intentions regarding moving away from the area to undertake further study. Fifty three per-cent indicated that they would be moving away from the area to undertake further study. When asked to express their immediate concerns about university life, they identified a significant and lengthy list of legitimate issues. Detailed findings of the pre-course evaluation confirmed that much work was needed in the area of transition and a full description of those results can be obtained from the authors.

## THE PILOT PROGRAMME

The pilot programme was delivered on-campus at CQU - Rockhampton between 22 April, 1998, and 23 July, 1998. Students attended the pilot programme over a period of 10 weeks (2-3 hours per week) in the university environment where a high degree of 'socialisation' could be experienced. The students received TAPP material using a combination of lecture and tutorial formats, which allowed them to experience both of these frequently used tertiary educational delivery methods. This delivery occurred concurrently with their year 12 studies. Ms White, the course co-ordinator developed the bulk of the TAPP material and Ms McGuire assisted her in this process. Ms White also delivered the majority of lectures.

The students were also involved in other activities outside the classroom, including orientation programmes with the Student Association, meetings with other faculty staff, social functions with various departments, and so on. This had advantages in the preparation of these students for tertiary study, helping to ease the transition from a high school teaching/learning environment to a university teaching/learning environment. Table 1 illustrates the weekly lecture schedule used for the pilot programme.

Table 1 Weekly lecture schedule – TAPP 1998.

| Week | Topic |
|---|---|
| 1 | General Introduction, Further study, Why University?<br>Campus Tour / Orientation |
| 2 | What Job suits Me?<br>What Jobs Pay |
| 3 | Relevant courses / Universities / colleges etc.<br>Modes of Study / Entry Requirements / Scholarships etc |
| 4 | How to make the decision on course / university etc.<br>Location, cost of living, reputation of course, graduate placement, personal factors etc. |
| 5 | Contact in area of interest |
| 6 | Your First Year at University Part 1 - Moving Out, Budgeting and Accommodation, Classes, Your Rights and Responsibilities<br>Study Skills Part 1 - Importance of Planning, Time Management, Effective Note Taking |

| | |
|---|---|
| 7 | Your First Year at University Part 2 – Clubs and Societies, Drugs and Alcohol<br>Study Skills Part 2 – Library Tour, Referencing |
| 8 | Your First Year at University Part 3 – Student Politics, Student Unions and Representative Councils<br>Study Skills Part 3 – Writing Skills, Assignment |
| 9 | Your First Year at University Part 4 – Support Services Available<br>Study skills Part 4 – Oral Presentation Skills, Surviving Exams |
| 10 | Contacts in relevant areas of interest / courses / universities etc.<br>Other information – Austudy / Abstudy / HECS etc.<br>General Summary |

*Source: Unit Profile CQU Faculty of Business and Law, 1998*

Integral to the TAPP was the co-development of suitable assessment activities for this cohort. With the co-operation from staff of the Glenmore State High School, the assessment activity was embedded into their existing school curriculum.

In this way assessment requirements of the programme presented minimal interference with the existing time-constraints of the senior schooling assessment schedule.

The assessment activity was drawn from a previous assessment piece completed in English where students were required to write a paper titled 'World of Work'. This paper necessitated them to research a preferred career choice and develop a written profile of this career option for information and use by others.

For the TAPP assessment activity, students were asked to re-write this piece of school assessment, incorporating all of the learning skills that were covered as part of the TAPP programme. This required using appropriate referencing, academic writing styles, additional independent research, report writing techniques and a range of associated academic skills. The students were assessed on this paper at undergraduate level, so as to give participating students and their teachers an accurate measure of their standard at tertiary level. Overall students performed well on this assessment activity. The final assessment results are displayed in table 2.

Table 2 Assessment results – TAPP 1998.

| Grade | | Marks Range | Number |
|---|---|---|---|
| HD (High Distinction) | | 85-100 | 4 |
| D (Distinction) | | 75-84 | 4 |
| C (Credit) | | 65-74 | 5 |
| P (Pass) | | 50-64 | 9 |
| F (Fail) | | <50 | 1 |
| DNS (Did not submit) | | | 4 |

*Source: (White, 1998, p. 11)*

In this way students not only clarified their perceptions of what was required of assessment at tertiary level, but also increased their confidence in attempting an assessment activity at this level of study. Students who successfully completed the assessment received a 'Certificate of Achievement' from CQU and those who did not submit the assessment activity or were awarded a "fail" grade, received a 'Certificate of Attendance' for their participation.

Following the completion of the course, the graduates were presented with their certificates at a public ceremony attended by senior university staff, the district education director, local educational professionals, parents, friends and families. During the awards ceremony a multi-media presentation of the programme was made to the audience and this presentation stimulated many inquiries from schools in the region. The entire TAPP enjoyed substantial media coverage in both local media as well as national media with many interviews and presentations flowing from the pilot programme.

## PILOT COURSE EVALUATIONS AND OUTCOMES.

On completion of the programme, a post-course evaluation was conducted at CQU. The GSS set-up and pairing of students was used in a similar manner as the pre-course evaluation. In addition to the original 16 questions (pre-course evaluation), several additional questions were asked of respondents. These questions were designed to collect general information regarding perceptions and opinions of the completed course. Students enthusiastically participated in the post-evaluation session. It was evident that there were notable changes in the levels of understanding by students on a wide range of issues compared to the pre-evaluation.

This comparison is perhaps best highlighted with the three previous examples discussed.

1. From a position of uncertainty, the economics of student life were now more realistic, with precise, accurate dollar amounts now able to be identified by students for specific activities.
2. On completion of the TAPP, results indicated that 32% of students would be moving out of the region to undertake further study and a significant 68% indicated they would be staying within Central Queensland for this purpose. This represents a significant decrease in those students who had initially indicated their intention to move away from home to undertake tertiary study.
3. The concerns students had identified about university life were significantly reduced on completion of the TAPP. From the original long list of concerns, the only concerns remaining included:
   a. being accepted to course of their choice
   b. cost/money
   c. moving away from home
   d. OP (ENTER) scores

It is noteworthy that when asked what did they want to gain from the TAPP, students' responses included:

- a better/fuller understanding of university life;
- confidence in dealing with university life;
- what to expect at university;
- information on different courses, and;
- how to choose a course.

On the completion of the course 100% of the students indicated that they had gained what they had originally wanted and 100% also indicated that they would recommend the programme to other students. This is by far the strongest support for the success of the programme in dealing with transition issues from the perspective of the primary target group.

Anecdotal evidence suggests that participating students also showed signs of increased confidence over the course of the programme. This was particularly evident during the subsequent CQU Open Day activities where observation revealed many of these students adopting a "leadership and mentoring" role with students unfamiliar with the institution. It is anticipated that any increase in confidence in dealing with the university system, prior to entry, would have positive implications for those students who eventually make the transition from high school to university.

## IMPLICATIONS AND SUGGESTED FURTHER RESEARCH.

Following on from the pilot programme a number of issues that needed closer attention became evident. Firstly the resourcing issue regarding "who should fund" such activities was questioned. Other issues included:

- Marketing (of the programme and outcomes);
- The importance of the links between university and school as well as the links between educational professionals from those areas;
- Accuracy and currency of information delivered during the programme;
- Inclusion of traditional non-tertiary bound students;
- Delivery modes – the ability to be inclusive over a wide geographic area;
- Internships and the desire (and need) of students to gain commercial experience while undertaking tertiary study;
- The value of students attending in an "on-campus" mode to heighten the socialisation aspects of university life;
- The potential to reduce retention problems associated with first-year undergraduate study.

## CONCLUSION

In all, the TAPP provided the participating students with a unique experience of undergraduate life. They gained new skills, reinforced existing skills and increased their knowledge of the many facets of university life. They were exposed to the realities of possibly living away from home for the first time, the importance and responsibility of independence, the expectations of first-year assessment standards. They were also given the opportunity to explore in depth and on-campus, their preferred areas of tertiary interest.

The researchers posit that while this course was recognised as a success and a worthwhile experience for all concerned, it is a preparatory course and of itself is not enough. Complementary programmes, such as Open Days, University Visits, Student Mentoring Programmes, School Visits, Enhancement Courses, Accelerated Learning programmes and the like, all have important roles to play. Once in the university system, many students require on-going support from a range of parties to make a successful transition. We, as educators and as parents share both a role and a responsibility in these transition activities.

## REFERENCES

- ACER., (1982). "From school to tertiary study". *Transition to college and university in Victoria*. Hawthorn, Victoria: Australian Council for Educational Research.
- Anderson, D. S., (1980). *Transition from school. An annotated bibliography of recent Australian studies*. Canberra: Australian National University Press.
- Beder, S., (1997). *Addressing the issues of social and academic integration for first year students*. Wollongong: Faculty of Arts - University of Wollongong.
- DEETYA., (1999). *Transition from Secondary to Tertiary: A Performance Study* (Report 36). Canberra: Department of Education, Training and Youth Affairs.
- El-Khawas, E., Hoffert, M., Skilbeck, M., and Wagner, A., (1997). *Thematic Review of the First years of Tertiary Education in Australia*. Paris.
- Gose, B., (1995). "A new approach to ease the way for Freshmen". *The Chronicle of Higher Education* (8th September 1995), A57-A58.
- Kantanis, S. T., (1998, July 5 - 8, 1998). "The role of programme cohesion in effecting a more recognised transition from secondary school to university". *Paper presented at the 3rd Pacific Rim Conference*: First Year in Higher Education, Auckland, and New Zealand.
- Macdonald, I., Litchfield, K., and Litchfield, J. (1998). *School Preparation for Tertiary Study*.
- McInnis, C., and James, R., (1995,). "First year on campus: Diversity in the initial experiences of Australian undergraduates". *Australian Government Printing Service (AGPS)*.
- OECD., (1977). Australia, *Transition from school to work or further study* (9264116990). Paris. France: Organisation for Economic Co-operation and Development (Washington, D.C.).
- Peel, M., (1998). *The Transition from Year Twelve to University* . Melbourne: Monash University.
- Power, C. N., and Cotterell, J., (1981). *Changes in students in the transition between primary and secondary school* (0642059624). Canberra: Australian Govt. Pub. Service.
- White, T., (1998). "Summary report: Findings and Results of the Tertiary Awareness Programme Pilot" *(Unpublished Report)*. Rockhampton: Central Queensland University.
- White, T., McGuire, R., Farrell, K., and Farrell, W., (1998). "A proposal to convert the Tertiary Awareness Programme Pilot, to the Tertiary Awareness Programme". *(Internal Report Unclassified)*. Rockhampton: Central Queensland University.

TEND 2000

## Crossroads of the New Millennium

# The Digital Curriculum Database: Meeting The Needs Of Industry And The Challenge Of Enhanced Student

Prepared and Presented

By

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Workshop 2

# Abstract

This paper describes a project being undertaken at The Northern Alberta Institute of Technology (NAIT) in Edmonton, Alberta, Canada. Titled, *Logging Our Curriculum*, the project involves creating a fully outcomes-based curriculum across the institution and housing that curriculum in a database that is accessible to NAIT instructors over the World Wide Web. The goals of the project are to assist NAIT to become more responsive to the fast changing requirements in industry, to provide instructors with shared curriculum development tools and resources and to provide students with more learner-centred learning materials that follow a pedagogically accepted and systematic instructional design model.

The presentation of this paper will precede an interactive workshop in which participants will walk through the curriculum database and use the curriculum development tools to build their own outcomes-based curriculum.

# The Digital Curriculum Database: Meeting The Needs Of Industry And The Challenge Of Enhanced Student Learning

Among all organisations in the tertiary education sector, technical institutions face unique challenges as they strive to fulfill their traditional roles in an increasingly global economy that is being transformed by technological innovation. Technical institutes have always been expected to provide job-ready graduates to industry by ensuring graduate proficiency in a list of entry-level competencies. However, two critical factors in today's economy are rendering traditional practices obsolete. The first critical factor is the pace of change that today's technical institute confronts. Technological innovation in industry is taxing the technical institute's capacity to respond with relevant curriculum. The process of curriculum development and redesign is often left to individual instructors who admirably endeavor to teach, maintain currency in their disciplinary fields and redevelop curriculum. This process taxes individuals and requires more time and effort than is often available.

The second critical factor that is forcing change in traditional practice relates to the learning needs of today's student. Whereas the industry specific skills-development approach to teaching and learning has served institutes well and will continue to form a large part of institutional culture, students today (including students of technical institutes) need to be prepared for an economy that will demand their continuing development. The reality is that no institution can expect to fully prepare students for today's workplace. For this reason, technical institutes need to teach not only the skills of a trade, they need to ensure students have developed skills in order to succeed as lifelong learners. The University sector in Canada has recognised this added value feature of a university education and has done a good job of marketing broad liberal arts education as a strong foundation to life-long learning. Thus, in order for technical institutes to remain relevant for industry and competitive with other educational institutions, a systematic response to updating teaching and learning processes is warranted. In many ways, these changes will strike at the heart of the very culture of education, both technical and otherwise. This paper describes the response of the Northern Alberta Institute of Technology to the challenges described above.

## THE DIGITAL CURRICULUM DATABASE AND THE CHALLENGE OF INDUSTRY-RELEVANT LEARNING AT NAIT

The Northern Alberta Institute of Technology (NAIT) is a technical institute in Edmonton, Alberta, Canada that yearly serves 7,500 full-time programme students, 7,000 apprenticeship student, and 40,000 continuing education students. In total, more than 50,000 learners come in contact with NAIT each year. NAIT is one of Canada's largest technical institutes and is Canada's largest apprenticeship training institution.

To date, NAIT has a solid track record of responding quickly and comprehensively to industry needs. It has been able to do this by maintaining close contact with accreditation bodies, through the establishment of a rich industry advisory network and by means of a competency profile development (CPD) process (similar to a DACUM) that is built on validation by industry. The competency profile development system has served NAIT well over the years and, as a testament to its quality, has been sold to other technical institutions around the world. However, while the competency development and validation processes are demonstrably successful, the process of introducing those competencies into the curriculum has become increasingly challenging. A systematic and routine process for ensuring both the regularity of the CPD process as well as the transfer of CPD recommendations into the curriculum design process has not been fully realized.

## THE LOGGING OUR CURRICULUM PROJECT

The need to *normalise* the process of curriculum renewal in the face of variable industry dynamics has given rise to the establishment of an institutional curriculum database. The digital curriculum database is the technological underpinnings of a strategic institutional initiative to transform all NAIT curricula into outcomes-based modules. The project is called *LOGging Our Curriculum* and the first step has involved a course by course identification of learning outcomes for all courses at NAIT. The outcome statements have been fashioned in a consistent institutional format incorporating an accepted list of verbs that can be classified according to Bloom's taxonomy. The marriage of this classification scheme with database technology means that instructors can use technology to better identify the various levels and domains of knowledge that are contained within their curriculum as per Bloom's generally accepted classification system. A subsequent section will describe how the database of learning outcomes is tied to a more comprehensive curriculum development methodology. However, it is worthwhile here to consider the institutional implications of an accurate, real-time record of all NAIT learning outcomes and a consequent shared curriculum resource.

## INDUSTRY RELEVANT CURRICULUM

As noted above, a continuing challenge for NAIT instructors has been the need to incorporate regular competency profile development recommendations into their curriculum. This is no small task for instructors given that they carry full teaching loads and are dedicated teachers who commit to spending additional time assisting students in many ways throughout the course of a year. The LOGging Our Curriculum initiative offers an opportunity to update the CPD process in order to *normalise* the function of curriculum validation and renewal in the context of an instructor's regular work. The process will allow programmes to generate a survey drawn from the curriculum database that will be distributed to industry. The results of that survey will inform further curriculum development. Because the curriculum is entirely built upon individual outcomes, the consequent granularity will allow instructors to reconstruct courses without complete course overhauls.

## SHARING CURRICULUM

Another advantage of the curriculum database is the opportunity that instructors will have to share curriculum across the institution. It is well known that all programmes teach to many of the same learning outcomes. For example, learning outcomes associated with basic computer skills, team building, conflict management and Ohm's Law are just a few of the learning outcomes that are critical to student success in many programmes at NAIT. However, curricula to support these outcomes have traditionally been developed in isolation, programme by programme. As a shared resource available to all, the curriculum database will allow instructors to both submit their ideas and draw on the curriculum development expertise of their colleagues across the institution. The curriculum model that has been developed is sufficiently flexible to allow instructors to draw on a consistent curriculum framework while at the same time allowing them to bring to bear their own personal teaching artistry.

## AN INTERDISCIPLINARY RESOURCE

Another benefit of the shared database is its interdisciplinary nature. While technological innovation drives a continuing march towards greater industrial technology convergence, technical institutions should naturally look to greater interdisciplinary activity. For example, the cabinet making industry has been revolutionised by the introduction of information technologies into its practices. It is incumbent on tertiary institutions to break down disciplinary walls and ensure that the reality of this convergence in industry is reflected in the form and content of the curriculum that students will encounter.

## AVOIDING DUPLICATION

The curriculum database will ensure overlapping effort is kept to an absolute minimum. With an instructional staff that numbers 800, it is clear that instructors cannot possibly stay aware of what curriculum development is underway across the institution. The curriculum database provides an accessible means by which an instructor can make choices about what curriculum to develop and what curriculum already exists that they are entitled to use. This sharing of knowledge will help NAIT avoid the unnecessary duplication of effort and, at the same time, act to magnify the intellectual capital that already exists. For example, the knowledge that a high quality module on Ohm's Law already exists frees an instructor to focus valuable curriculum development time on preparing new modules to meet the emerging demands of industry or on refining modules in areas that pose particular challenges for students.

Finally, the curriculum database will provide an invaluable resource for the business development unit of NAIT to design customised training for a myriad of industry clients. A large and increasing portion of NAIT's revenue comes through providing continuing education services to industry clients who demand a more customised and focussed approach to training. NAIT's outcomes-based format is ideally suited to designing a curriculum that can be quickly and effectively delivered in keeping with the *just in time* demands of many industry clients.

## THE DIGITAL CURRICULUM DATABASE: THE CHALLENGE OF CHANGING LEARNER NEEDS AND EXPECTATIONS AT NAIT

### Systematic Instructional Design

It is important to make clear that the curriculum database is not simply a means to ensure a valid series of learning outcomes is assembled to meet the demands of industry. While the needs of industry are important to all decisions that are made in regards to curriculum at NAIT, students remain NAIT's primary customers and it is the needs of students that provide the momentum behind LOGging Our Curriculum. Because students remain at the forefront of academic decision making, NAIT is committed to ensuring a pedagogically sound curriculum design and delivery model is utilised across the institution. The LOGging Our Curriculum project prescribes an institute-wide approach to instructional design that is proven successful and particularly apt in a technical institute setting. Kolb's experiential learning model forms the foundation for NAIT's institutional standard and befits an organisation with a hands-on, activity-oriented approach to learning. The incorporation of the experiential learning model into the database design ensures that NAIT's curriculum includes hands-on, practical components.

**Empowering Learners**

Preparing students for success in the workplace must go beyond ensuring they have mastered industry specific skill-sets. Graduates into today's workplace need to be flexible, critically analytical thinkers in order to master ongoing changes in today's world. We know that today's graduates will work in multiple careers and settings throughout their lives and NAIT is eager to provide these students with the skills necessary to succeed in such environments -- skills such as self-inquiry and learning autonomy. LOGging Our Curriculum puts well-developed Learning Outcome Guides (LOGs) into the hands of students. These empowering tools will each provide a clearly articulated learning outcome, a rationale, pre and post tests, enabling objectives and a description of learning activities that students will engage in to meet each objective.

In some ways, the LOG will serve as a contract between industry, instructors and students. Recall that the Learning Outcome Guides are directly drawn from the *industry-validated* database so the LOG will reflect the learning outcomes that are identified in the database. Students will receive the LOGs at the outset of each course and instructors will use the LOGs as guides throughout the term. The expectations of both instructors and students will be clear at the outset of each course. The LOGs emphasise a learner-centred approach in that the curriculum will be laid out in advance for students. Those students who are able to work ahead will have the freedom to explore the curriculum as they plot their own learning pace and pathway.

While students will *need* a more learner-focussed and empowering approach to education in order to develop skills that will allow them to succeed in the new workplace, they will also come to *expect* a different pedagogical approach from tertiary institutions. The term *consumer* as a synonym for student has found its way into the vernacular of educational discourse. While this might offend many, its reality can be readily seen in most educational environments where concepts such as "customer service" herald a new era for educators. Students themselves, many of whom are required to shoulder greater fiscal responsibility for their education as various levels of government accede responsibility to the end-user, will begin demanding more empowering instructional approaches. Students will not abide the over-crowded time-and-place-dependant lecture theatre when new technologies can just as readily facilitate the lecture-based form of information transfer. Rather, students will look to their interactions with instructors and peers for value-added activities that will facilitate the construction of new knowledge in the collaborative environment. Learning Outcome Guides are designed to facilitate just this form of activity. As learner-focussed tools that will facilitate the transfer of information, they are meant to complement classroom activities in which the learning group can then collectively explore information that will lead to better knowledge acquisition, retention and the development of greater learner capacity for analysis and synthesis.

## Logging Our Curriculum: A Vision For The Future

LOGging Our Curriculum is a project that will position NAIT for the future of learning. In the new millenium, students will arrive at NAIT's doors with considerably different needs and expectations. From their primary school days onward, students will be increasingly exposed to technologies such as the Internet that facilitate independent learning and self-inquiry. These will be confident and technologically literate individuals who will demand learning that meets their personal requirements. LOGging Our Curriculum is just the first step in a process that will offer more *on-demand* learning for students. For this reason, other institutional measures will be required such as better access to network resources, greater accessibility through electronic and face-to-face means to instructional staff, and greater acknowledgement of past learning through the implementation of systematic approaches to prior learning assessment and recognition.

Many of these changes are anathema to the culture of academic environments. However, the revolution in learning has already begun. One need only look at the proliferation of online distance education programmes throughout the world to understand that innovation in academic environments is upon us. Technical institutes face a particularly difficult challenge as they find themselves most directly affected by the revolution going on in industry. However, by responding quickly to those global economic forces, technical institutions are positioned to be the leaders in learning innovation.

## REFERENCES

- Bloom, B.S., (1984). "Taxonomy of educational objectives", *Handbook I: Cognitive domain.* Addison Wesley Longman.
- Grondlund, Norman E., (2000). *How to write and use instructional objectives.* 6th Edition, Prentice Hall.
- Kolb, David A., (1983). *Experiential Learning: Experience as the Source of Learning and Development.* Englewood Cliffs, NJ: Prentice-Hall.
- McCarthy, Bernice., (1987,1981). *The 4MAT system: Teaching to learning styles with right/left mode techniques.* Barrington, IL: Excel, Inc.
- NAIT Programme Planning and Development Guidelines, (1998). *NAIT becoming a master instructor programme - Module 2.* Edmonton: The Northern Alberta Institute of Technology.

TEND 2000

## Crossroads of the New Millennium

# Culture And Sustainable Development

Prepared and Presented

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# Culture and Sustainable Development

## INTRODUCTION

At the outset, I would like to apologise to the organisers of the conference for changing the title of my speech from their suggested, " Culture at the Crossroads: into its present form, "Culture and Sustainable Development". The main reason for the shift of emphasis is related to the complex socio-economic stage through which present day UAE in general, and Dubai, in particular, is passing.

At present Dubai is laying down the foundations for sustainable development. It has a world class service sector like hotels, communications, electricity…etc, together with a well connected air links to the most important world destinations, coupled with a well maintained first class road network. An advance public health and educational systems are also well looked after.

In addition to this world class infrastructure, Dubai is characterised by social tranquility and a high level of security service which makes the Emirate a more attractive place to live and work. This is why all the government agencies in Dubai are working together to make it the city of excellence and a world class centre for business and trade, attracting diversified nationalities, from different cultural backgrounds - a truly cosmopolitan city.

## CULTURE AND DEVELOPMENT

Only ten years back or so, culture was considered as an exogenous factor in almost all the development models, especially the neo-classical models of growth. And if the topic which I am outlining now has been raised in a classroom then, ie. culture is considered as part and parcel of development models, any professor, and there are many amongst this distinguished audience, would have described this apprehension as utopia, to say the least.

Culture was not considered as part of development thinking except recently, ie. when the World Commission on Culture and Development has submitted its report entitled, "Our Creative Diversity" to UNESCO and the United Nations in November 1995. The gist of this report is that, "Development divorced from its human or cultural context is growth without a soul. Economic Development in its full flowering is part of a people's culture."

Therefore, the question at the heart of the development process is this: what policies promote a sustainable development that encourages the flowering of different cultures? This question directly leads to the concept of human development, for which you are most concerned, and which refers to the individual human being, who is both the ultimate objective of development and one of the most important instruments or means to it. An alert, skilled, educated, well-nourished, healthy, well-motivated labor force is the most productive asset of society.

Since people were together, co-operate, compete and interact in many ways, culture connects them with one another and makes the development process possible. Therefore, development and the economy are part of a people's culture. Hence, culture is not only a means to material progress, but it is also then end and "development" is considered as flourishing of human existence in all its forms and as an integrated whole.

## WHAT IS CULTURE?

The word 'culture' stems from the Latin "colere" translatable as to build on, to cultivate, to foster. In the early stages of the philosophical debate about what is 'culture', the term often refers to the opposite of 'nature', where 'culture' was referring to something constructed willingly by men, while nature was given in itself.

The concept of culture has so many diversified definitions which could be summarised as follows:

- Topical: Culture consists of everything on a list of topics, or categories such as social organisations, religion…..etc.
- Historical: Culture is social heritage or tradition that is passed on to future generations.
- Behavioural: Culture is shared, learned human behaviour, a way of life.
- Normative: Culture is ideals, values, or rules of living.
- Functional: Culture is the way humans solve problems, adapting to the environment or living together.
- Mental: Culture is a complex of ideas and learned habits that distinguish people from animal.

So, it is clear that it is rather difficult to adopt a single unified definition of culture. But in our present context, we will adopt the definition of culture as the collectively held set of attributes, i.e., shared values, believes and basic assumptions, which is dynamic and changing over time.

## THE POWER OF CULTURE

We are living at present in a culturally value-added world. Two aspects will suffice to illustrate the point:

Creativity: allows us to re-invent every day life, the way we live. Creativity allows us to re-invent meanings and responses. Creativity allows us to shape and design our future destination. That is the power of culture. It unites people around some key principles: infinite diversity and universal values. Our hope for the future lies in the limitless powers of the creative imagination.

Interaction: everybody who uses more than one language, who interact with people of different backgrounds or nationalities, face to face, by fax, phone, e-mail, over the Internet, everyone who does this is drawing constantly on his cultural resources and on his ability to engage with cultural diversity. This again is a power of culture.

## CULTURAL FREEDOM

UNESCO's Report stresses cultural freedom as a prerequisite for the realisation of the power of culture but it also states that it is not quite like other forms of freedom because:

Firstly: most Freedoms refer to the individual. Cultural Freedom, in contrast, is a collective freedom. It refers to the right of a group of people to follow or adopt a way of life of their own choice.

Secondly: Cultural freedom is guarantee of freedom as a whole. It protects not only the collectivity but also the rights of every individual within it.

Thirdly: by protecting alternative ways of living. Cultural freedom encourages creativity and diversity - the very essentials of human development.

Fourthly: freedom is central to culture, and in particular the freedom to decide what we have reason to value, and what lives we have reason to seek.

One of the most basic needs of marketing is to be left free to define his own basic needs. This need is being threatened by a combination of global pressure and global neglect.

## CULTURE AND GLOBALISATION

Globalisation is a process affecting almost every part and every aspect of today's world. It is apparent in the growth and extension of international trade, linked to the search for world markets and economies of scale, in the new forms of the international labor markets, in the global financial flows that take no account of national frontiers, in the development of TNCs or multinational enterprises based on cross frontier alliances.

Therefore it is logical to say that international inter-dependence is great, has increased, and will continue to grow. Rapid progress in transport and communications have shrunk the world. With a rise of the Internet around the globe, intercultural communications become " a mouse click away". The international spread of cultural processes, however, is at least as important as that of economic process. Globalising cultural processes entails the danger of the demise of other cultures, the societies of which do not command strong holds in the international economy or global information network.

But globalisation has two components: those who 'globalise' and those who are 'globalised'. I would like to make it absolutely clear that given our strong cultural heritage, we will be among those who 'globalise' and will work hard in order not to be 'globalised'.

We will also work hard to step beyond the view of development that sees nothing but macroeconomic growth achievements and to include all aspects of culture in it and put all spheres of knowledge in its service through more effective educational system.

## CULTURE AND EDUCATION

Education is fundamental not only to the transmission of culture but to preparing the ground for its continuous renewal. Who today can doubt that education is the key to meeting the two most important challenges of our time promoting sustainable development and nurturing a culture of peaceful coexistence? Education is vital to building up the critical mass of knowledge and the technical capabilities required for economic and social progress and to reducing the unacceptable inequalities of wealth and opportunity within and between nations. More importantly, perhaps, it is our best hope to ultimately determine whether scientific and technological invention serves to benefit or to blight human existence. There is no more important task for education at the present time than to:

- Educate our children and young people with a sense of openness and comprehension toward other people, their diverse cultures and histories and their fundamental shared humanity.

- Teach them the importance of refusing violence and adopting peaceful means for resolving disagreements and conflicts.
- Call for the rejection of the logic of force in favour of the force of logic.

I believe that these principles are essential to the pursuit of creativity and innovation - the treasure of mankind and the source of human progress - in an ever more interdependent world. This can not be realised unless all of us are highly committed to the principle of "education for all throughout life - culture for all throughout life".

## CONCLUSION

I will conclude by highlighting and stressing some key issues in educational policies. In this respect, I fully agree with UNESCO's final report on cultural policies for development which affirms that:

- Cultural policy, as one of the main components of endogenous and sustainable development policy, should be implemented in co-ordination with policy in other social areas, on the basis of an integrated approach.
- Cultural policies for the new millennium must be anticipating, responding to persistent problems as well as to new needs.
- Effective participation in the information society and the mastery by everyone of information and communication technology constitute a significant dimension of any cultural policy.

Lastly, I would like to stress a highly critical factor for achieving a sustainable development process, and no doubt that you play a leading role in its realisation, namely, reducing the present dichotomy between culture and education and rapidly integrating culture into our academic curriculum at all educational levels. This is the only way to produce the risk-taker individual who is so crucial for sustainable development because risk without knowledge is so dangerous and knowledge without risk is useless.

I would also like to remind you that when culture is understood as the basis of development and when policies for development become profoundly sensitive to and inspired by culture, rest assured, that the funds necessary for broadening educational policies, in order to achieve this objective, will be released by the government.

TEND 2000

## Crossroads of the New Millennium

# Using Technology To Foster Authentic Communication For Second Language Students

Prepared and Presented

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# Abstract

Higher literacy needs and global communication technologies such as the internet are requiring that students world-wide develop academic level mastery of international languages such as English and French in order to compete globally in economic, academic or government professions. However, whereas school and university second language programmes are frequently able to produce a Basic Interpersonal Communications Skill level of mastery of second languages, there are few university second language programmes that consistently produce a high level of mastery of Cognitive-Academic Language Processing and in a second language. Existing second

Language programmes frequently lack the sustained concentration of interactive time dedicated to negotiation of meaning in the second language to make academic levels of mastery a realistic expectation for the majority of university students. Too frequently, existing programmes, due to limited resource allocation, are rather more passive than active with few hours per week in which the students can interact on topics of mutual interest. Recently, preliminary studies using WebCT internet technology have shown how student-initiated interactive second language communication may be used to supplement more traditional approaches, and in particular, the effectiveness of university level immersion ESL courses where students learn academic course content through ESL, (see Carey and Crittenden, 1997; 1999; Carey, 1998; 1999. In these studies, university students actively negotiated the meaning of extensive resources and readings in a second language on asynchronous electronic bulletin boards whenever they had interest at home or university. This student centred approach appears promising based on results from a detailed discourse analysis of the students communications on the bulletin boards as well as from reading comprehension and writing production tests. In addition, extensive formative and summative interviews of the students use and attitude towards reading and discussing course content on the electronic bulletin boards for second language acquisition yielded positive results of how the WebCT bulletin board facilitated SLA. Ongoing research with real-audio and visual modalities is very promising.

# Using Technology to Foster Authentic Communication for Second Language Students

As the United Arab Emirates enters the millennium, the UAE Ministry of Education is placing a new emphasis on increasing the exposure of UAE students to ESL in elementary, secondary and university education. This increased emphasis comes from a realisation that English literacy is increasingly mandatory in a global world and a realisation that existing UAE ESL instruction programmes are inadequate to produce the necessary academic literacy and oral fluency. The limited success of ESL in UAE schools echoes similar results for ESL elsewhere in the Middle East and Asia and mirrors many other foreign language programmes around the world.

In general, traditional foreign and second language ESL programmes are not effective in producing academic literacy and oral fluency because in typical ESL language programmes there is inadequate exposure to the foreign language and because there is very limited opportunity to use ESL outside the classroom in mid-east and Asian settings. We have known for many decades that it takes about 5,000 hours of instruction in a second language to produce adequate fluency and literacy in that foreign language, Stern (1983) and typical foreign language programmes offer far less than this minimum exposure to the language.

In order to get a general idea of what results can be obtained from different types of foreign or second language programmes, I will examine 4 of my own research projects on different second language situations and gauge the effectiveness of these approaches in terms of their results in producing academic literacy and oral fluency. From the results of these research projects a model may be constructed that would promote ESL in UAE.

## A LONGITUDINAL STUDY OF FRENCH IMMERSION IN CANADA

The first research project will be a study of French immersion programmes in Western Canada. These widely celebrated second language programmes initially involve almost exclusive elementary schooling using the second/foreign language as the language of instruction. In the first implementation of these programmes Lambert, Tucker and d'Anglejan

(1974) anglophone children received their instruction almost exclusively through the second language of French for the first 3 years and then gradually an increasing number of different school subjects were taught in their native language of English and a decreasing number were taught in their second language of French from grades 4 to 12 in order to promote bilinguality. These immersion programmes have been very successful in producing a functional level of French fluency and literacy. However, the level of reading and listening comprehension of input and the level of speech and written output of these students does not generally approximate their English reading comprehension or speech, Carey, (1984: 1991; 1997). In a series of replicated research which involved large scale province wide sampling in Western Canadian provinces, I found that although students were schooled in given disciplines in French, their capacity to write the final exams in these subjects was much higher if they were permitted to write these final exams in English (even when they were true-false or multiple choice) in spite of the fact that the entire course had been taught in French and students anticipated a French final exam, Carey, (1991). Simply stated while these students acquired a functional level of oral fluency and reading comprehension, and to a lesser extent writing proficiency, their level of performance in reading, writing, speaking and listening on average never attained a level comparable to their home language even after 8, 10 or 12 years of immersion schooling. In some ways this is not surprising because the language remains a school-based language and these students seldom use this language outside the school Carey, (1984; 1991) even when presented with opportunities to use this second language.

## A STUDY OF HIGHLY SUCCESSFUL FRENCH IMMERSION STUDENTS.

There are however very high achievers in immersion programmes who are gifted language learners, who enjoy practicing their second language whenever possible, and who supplement their classroom assignments with a variety of additional exposures to the second language. In addition to taking the initiative to use their French wherever possible and to exploit any opportunity to use and study the language locally, some French immersion students take advantage of excursions to French speaking areas which may vary from a few days to several weeks to year abroad programmes. In such cases high degrees of competence may be attained in reading and listening comprehension as well as spoken and written production. Typically, students find these sojourns extremely productive in improving their second language skills. However, we must realise that these levels of French achievement are not directly attributable to the immersion schooling programme per se and may have been largely attained without any participation or exposure to the second language immersion programme at school. Simply stated, these highly competent individuals may have attained most or all of their facility from these diverse experiences outside school. Nevertheless, it is these exemplary individuals who are most frequently put on display at events such as "concours oratoire" as examples of what can be achieved by immersion programmes. Clearly, such experiences as exchange and year abroad programmes provide tremendous opportunities for students to actively engage in communicating in the second language but it is inaccurate to then claim that the gains made are a result of the direct immersion schooling programme. In fact, informal comparisons between core French students who spent a year abroad appeared to be indistinguishable from students with immersion backgrounds and in many cases were actually superior, Netten, (1999). In either case however, we must recognise the important and real gains that students can make if they voluntarily initiate and actively engage in interactive communication in the second language either locally or abroad. However, even in such situations, expected gains must be realistic and the nature of the interaction is critical to the obtained results. In particular, students must take the initiative to be active communicators who willingly engage in language interaction to maximally benefit from exchange and year abroad programmes. However, even under the most ideal situations some students somehow manage to avoid all opportunities and make even a little progress.

## A LONGITUDINAL STUDY OF THE EFFECTS OF AN ACADEMIC YEAR ABROAD ESL IMMERSION PROGRAMME FOR JAPANESE STUDENTS

The individual motivation for engaging in communication in a second language is an essential yet complex issue but we can gain insights into its importance by examining the progress made by different cultures and by a comparison of gender across cultures in an ESL immersion programme. In an ongoing analysis of a year abroad ESL immersion programme for Japanese second year undergraduate's students at UBC, we have performed a comprehensive study of their development and acquisition of ESL/acculturation as well as their identity and globalisation transformations during the year abroad experience. We have also researched the subsequent retention of these changes for 7 years following this year abroad. Some of the most insightful findings from this comprehensive study of the largest year abroad ESL/acculturation programme that we know of derive from cultural and gender comparisons.

## CULTURAL COMPARISONS

It is accepted doctrine of stereotype that Japanese students tend to be more group minded than North American students and that Japanese students of ESL are less likely than Western Europeans to initiate conversations and seek out foreigners and engage them in conversation in their attempts to master ESL, Bailey, (1999). Japanese ESL students are often stereotypically characterised as shy, conforming and reticent when contrasted with North American students (Bailey, 1999). Consequently, assuming that social interaction is critical to second language acquisition, one might suppose that as a gross generalisation that Japanese students would be less likely to show ESL improvement from a year abroad programme than would students from Europe. However, such generalisations must bear in mind that there are often not only greater cultural differences between Japanese and Canadian cultural groups than between Western Europeans culture and Canadian culture groups but equally important and related linguistic differences that are also greater between Asian languages and European languages and English. Consequently, at universities such as UBC one can frequently observe Japanese students interacting linguistically and socially in English with other Asian students more frequently than with Canadians. Apparently, the commonalties of culture among the Asian students permits them to converse in English more easily than with native English speakers. Therefore, when we assess how much improvement in ESL occurs among Japanese students in a year abroad programme in Canada we might in general not expect there to be the same gains as would be expected by European students. Furthermore, we might hypothesize that Japanese students are more challenged with learning a language from a different language family as well as acculturation to a very different culture and that these Japanese students would not make as rapid gains as would European students who have a more common first language and culture from which to transfer both their language and cultural skills. Therefore, we must be realistic in terms of the improvement expected by Japanese students in a year abroad programme.

Therefore in this study we chose to use the TOEFL test to see if there were any discernible measures of improvement in the Japanese students ESL scores based on a comparison of their scores prior to and immediately after the 9 month programme, Crittenden, (1996). We also sought to make pre and post comparisons between the students performance on the oral, written and reading comprehension tests for each of the 100 member cohorts over several successive years and then to follow the retention of their ESL characteristics and to follow their acculturation and globalisation changes over several years after returning to Japan.

While room does not permit a detailed discussion of all the statistical results, it is important to note that these 100 member yearly cohorts consistently showed statistically significant improvement in their ESL as measured by TOEFL as well as by Oral Proficiency Inventories (OPI), tests of written English (TWE) and written Cloze tests, (Crittenden 1996; Carey and Crittenden 1997). Moreover, the degree of improvement in the TOEFL as well as the Oral Proficiency tests was greater for those students who originally scored in the lowest quartile of the incoming cohort. Not surprisingly, a detailed analysis of the English language history of these low scoring students showed that generally they had fewer hours of prior ESL, less exposure to English usage at home, had traveled less to English speaking countries and were less likely to be exposed to English speaking relatives.

Consistent with the above, the highest scoring incoming quartile of students did not show highly significant gains as a result of the 9 month year abroad programme. A further detailed analysis of the ESL histories of the highest ESL scorers of incoming Japanese students revealed that the high achieving quartile had a much greater previous experience with English including a higher probability of exposure to ESL in elementary school, English being spoken in the home, a member of the family speaking English and travel to English speaking countries. Consequently, there is a very clear finding that the TESOL scores of incoming students are consistently related to the prior total experience with ESL within the school, the home and society. Since, the lowest scoring quartile of Japanese students had the largest improvement from the year abroad programme, the most likely account of these results is that the high ability group by being immersed with lower quartiles of ESL speakers had less of an opportunity to be exposed and to interact with colleagues from who they could acquire new vocabulary, idiom, metaphor and general literacy. This is an important finding in planning the activities of diverse second language programmes since it appears that unless highly enriched language environments are provided there is always the possibility of ESL acquisition attaining a plateau from which it is difficult to rise further unless students are provided with further enriching language experiences that are appropriate to their individual level. In the case of the upper quartile this would mean enhanced experience with native speakers within the programme, across campus and in the city. Clearly, sustained exposure to ESL in school, home and society are required for high levels of TOEFL, OPI and WPI.

In the 7 year follow-up of these Japanese students we also found evidence that the retention of their English skills, acculturation and globalisation measures were also directly correlated with their opportunities to use their English in the home, in their careers and in their social life. Again, it is the totality of the cumulative experience of using English in diverse settings that is important in second language retention as Fishman (1966) has previously noted.

## FSL CORE PROGRAMMES

A related example of attaining a plateau is found in FSL or extended FSL programmes for Anglophones in Canada. Too often, FSL students will acquire a sufficient level of FSL for essential oral and written communication at school and their level of mastery of FSL will not move beyond that level. This is particularly true where FSL students are exposed to other FSL students who have not had a rich background in French.

## MINORITY FRANCOPHONE SCHOOL PROGRAMMES

A related phenomenon has also been found for minority Francophones in Canada who find that schooling in French is insufficient to ensure adequate exposure and usage of the language to promote high levels of academic competence. Having won the court battles for exclusive francophone schools, these minority groups find these schools by themselves are insufficient for producing high levels of French academic competence. Consequently, minority Francophones have argued successfully for the necessity of having French cultural centres to stimulate French as the language of the home, the school and the society, Landry, Allard and Theberge (1991) in order to make mastery and preservation of the language possible. Consequently, minority francophones outside Quebec strive to make Francophone enclaves which include schools, business centres, restaurants and cultural centres in order to give French a full and varied usage in all walks of life.

Quebec takes this argument to the extreme in resisting the encroaching use of English because it perceives that English threatens the usage of French. Thus Quebec maintains its provincial unilingual French status in order to resist the use of English in a bilingual Canada. The Quebec Separatist provincial government proposes that Quebec separate from Canada to preserve its language and culture from the inroads of English that surrounds it and threatens to envelop it.

The common thread that runs through all four of these SLA and minority language research domains is that it takes a high concentration of varied usage of a second language in a variety of communicative contexts that include school, home and society in order to master that second or minority language. This point was made by Fishman (1966), yet this imperative appears to continually escape language planners for educational programmes due to the strength of other curricular demands. The truth of this statement is seen if one examines the limited success of ESL programmes in Japan, China, Taiwan, Korea and the Philippines or elsewhere in Southeast Asia. Consequently, we are left with the challenge as to how we can provide an ESL programme that will permit Asian students in general to master ESL to a sufficient degree to compete academically in the global educational, business and research domains, which are predominantly in English. The solution to this dilemma may be to supplement limited ESL class time with technology of online instruction and virtual year abroad programmes.

## THE REALITY OF VIRTUAL REALITY AND AUTONOMOUS ESL INSTRUCTION ON THE INTERNET.

The SLA imperative is that ESL students need exposure to principles of interaction that embrace both language socialisation and teaching language through content to achieve academic mastery of ESL. This assumes that students need to be motivated to socially engage in the negotiation of meaning in a second language about material that is of great interest to them and to engage in negotiation of meaning with a wide variety of speakers on a wide variety of topics for an extended period of time.

I have found that interactive electronic bulletin boards such as WebCT are effective due to their great capacity for promoting unlimited amounts of interactivity and interaction between students posting messages on this asynchronous electronic bulletin board using academic and enriched English that is beyond their present level of comprehension. To understand this concept it is essential to realise that maximally efficient second language acquisition requires extended throughput which entails re-iterative intakes from the available input message and the extended negotiation and interpretation of these intakes to determine the interpretation that most closely approximates (both semantically and syntactically) its contextualised meaning and is consistent with the prior knowledge, context knowledge and knowledge of the communicator. SLA also requires an equally iterative process of negotiating and approximating the output prior to actually generating the edited output.

In this representation, the student starts to read the message on the bulletin board by beginning to interpret each word and word combination in terms of their prior knowledge, their knowledge of the particular communicator and the likely message content. Thus the student is making successive interpretations and reinterpretations of the gist of the message and particularly of the vocabulary items which may not be known or of which all meanings may not be known due to polysemy. This extended sampling of intakes and reiterations of negotiated meanings ultimately resolves itself into a most likely or highest probability interpretation of the input taking into account the domain of knowledge, the social context, and the relation with the communicator and a host of other contextual factors. Given that the comment or question has been resolved, the student now must negotiate a potential response to the query or comment. Again, the student negotiates among several alternatives and ultimately comes upon the general meaning of the output intended taking into account the multitude of contextual and social factors of the output. The next stage is to engage in successive negotiated constructions of the intended output that satisfies the condition of content, register, choice of idiom and lexical items. These successive iterations and constructions of the appropriate intended output include the choice of lexical items in L2 from the students' lexicon or external dictionaries. This will be highly individualised for each ESL student depending on the prior language history of the student and will have a high probability of correlating with the knowledge of the correct usage of these lexical items and their idiom and syntax. After successive constructions, the student will output the particular construction, which seems to be appropriate. It is this iterative process of extended throughput which consists of successive intakes from input or what Piaget called assimilation through equilibration and the progressive negotiation of meaning and subsequent construction of output that leads to maximal SAL or what Piaget called accommodation of schema.

What is unique to activity on the online interactive electronic bulletin board as opposed to interaction in a live seminar is that each student can individually control the speed of processing of their input and each individual word can be interpreted and then reinterpreted as one reads subsequent words which modify the context and appropriate meaning of the previous word(s) as the students progresses at their individual speed. Further, the meaning of unknown second language words can be approximated, guessed at or researched in a dictionary at the individual student's speed and in terms of the lexical and semantic knowledge as well as prior knowledge of each individual. This highly individualised timing and sensitivity of the bulletin board is a sharp departure from a traditional classroom where the message is either delivered too quickly or too slowly for the majority or all of the ESL students. Furthermore, on the electronic bulletin board, students can have unlimited throughput time to research words, to construct and reconstruct their best estimate as to the meaning of the input through taking successive intakes and subsequently when a meaning of input has been finally constructed to then begin to successively approximate and construct and reconstruct the intended output which is sensitive to the particular student or audience that they are communicating with. In a traditional seminar no such successive interpretations and constructions are permitted since the ESL student who requires such time is passed over and the seminar moves on without the ESL student. In addition, on the bulletin board the student can choose to read and respond to those items that of maximal interest unlike a classroom where the majority of input may be of no interest to the students yet they must passively endure listening to content that they have heard many times before with an equal lack of enthusiasm.

By empowering the student to choose to process those items of maximal interest a higher level of interest and cognitive arousal is maintained and students are more likely to construct appropriate interpretations and detailed output since the material is vital to them and they want to preserve their face with their colleagues and audience.

Consequently, it is proposed that it is this individualised and highly iterative nature of successive intakes of input and successive constructions of intended output of a virtual online seminar that can lead to maximal SLA. In addition because it is language learning through content and socialisation of language learning students have a high social value to be motivated to understand the messages and to construct responses that are intelligent and well expressed in their second language. Moreover, unlike a traditional class, students cannot "tune out" since only their "extended throughput" maintains the communication link. In addition, because the power relation between teacher and student is modified so that the ESL students are in control, the responsibility is on them to contribute to the virtual seminar in a manner that renders their ESL characteristics as invisible as possible. Due to the opportunity for extended throughput these ESL students can assume the role of native English speakers and play that role unbeknown to the native speakers with whom they are communicating online rather than remaining in the limited role of ESL speakers who might more likely receive foreigner talk.

In summary, it is proposed that this interchange approximates the most likely sequence to produce SLA because it allows the ESL student to engage in intelligent discussion on topics that are of high interest. This normally would not be possible in a classroom since the ESL students' time needs for lengthy throughput would not be tolerated and the ESL student's anxiety and embarrassment would often prevent him from answering or even functioning in a regular classroom. Similarly a native speaker would not tolerate this communication experience due to impatience and frustration from inappropriate, lengthy and uneventful throughput while this same native speaker could enjoy a meaningful discussion with the same ESL student on a virtual electronic seminar via bulletin boards due to the reduction in anxiety and time demands that a bulletin board makes possible.

Another far reaching component of WebCT is that it allows the ESL student's initial attempts to assimilate the academic input by contemplating and reflecting (equilibration) on the input for perhaps minutes, hours or days and then to compose the output after their mental processing or equilibration has resolved the input by accommodation of their schema or prior knowledge.

All of the above components are essential to acquisition of ESL academic capacity because language must be used in an academic sense to assimilate and accommodate strategies and concepts in the second language. That is to say, I am proposing that cognitive academic language processing in a second language is most rapidly attained if the language is acquired as a vehicle for processing academic concepts and strategies. This means that the second language should be used in a parallel way to the first language in solving problems and involved in thought as soon as possible in the acquisition history of the student. It is further hypothesized that by exploiting principles of language socialisation and language acquisition through content with such procedures as electronic bulletin boards that it may be possible for second language immersion programmes to produce students whose cognitive academic language processing approximates that of their native language. Although Canadian immersion programmes have been unable to achieve this, Carey (1991); it is possible that such immersion programmes which are supplemented with interactive bulletin boards such as proposed here could approximate that achievement more closely. Furthermore, since it is widely accepted throughout Asia that English is being acquired as a language of schooling, higher education and careers that Asian students may be more motivated to learn English for academic purposes than Canadians who frequently learn French for cultural enrichment with the knowledge that they will go to university in English. Therefore, I see great potential for ESL students gaining high levels of cognitive academic language processing if ESL classes exploit principles of the socialisation of language, teaching language through content and supplementing ESL schooling with online technology such as electronic bulletin boards starting as early as possible in their schooling. In particular, the rising educational potential of online seminars is based in part on several advantages that virtual seminars have over traditional classes. These would include unlimited ownership of the individualised time for constructing comprehensible input in a re-iterative manner that includes successive attempts to construct the comprehensible output that is specific to the particular audience, and the context. This provides for more thoughtful, individualised and complete learning of both the second language and the academic content. This innovation can provide an important supplement to traditional immersion programmes and can finally make it possible for immersion programmes to deliver their true potential.

## REFERENCES

- Bailey, A., (1999). "Misunderstanding Japan: A Cultural Hermeneutics Approach". *Unpublished Ph. D. dissertation.* U.B.C.
- Carey, S., (1999). "Opening our minds to highly interactive ESL acquisition". In *Proceedings from the Eighth International Symposium on English Teaching.* 15-25, Crane Publishing, Taipei.
- Carey, S., (1999). "Implications for language and cultural policy in the Asia-Pacific from experiments in official bilingualism and multiculturalism in Canada". *Polyglossia.* 1, 1-14. Ritsumeikan, University, Kyoto.
- Carey, S., (1998). "The national importance of ESL teachers in Taiwan". In *Proceedings from the Seventh International Symposium on English,* Teaching. 15-34. Crane Publishing, Taipei.
- Carey, S., (1997). "Language management, official bilingualism and multiculturalism". *Annual Review of Applied Linguistics.* 17, 204-223. Cambridge University Press.
- Carey, S., (1995). "The promotion of French and English as international, second languages to increase North-South dialogue in Africa". In F., Christie and J. Foley (eds.) *Some Contemporary Themes in Literacy, Research.* 104-129. Waxman Publishing, Munich.
- Carey, S., (1991). *The culture of literacy in minority and majority language schools.* Canadian Modern Language Review
- Carey, S., (1984). "Reflections on a decade of immersion". *Canadian Modern Language Review.* 41, 2, 246-249.
- Carey, S., and Crittenden, E. (1999). "Evaluating a web-based generic second language/culture methodology course". *Journal of the International Association for Language Learning Technology.* (in press)
- Carey, S., and Crittenden, E. (1998). "Pre-service, in-service and graduate seminar on-line language education courses". *Paper presentation at the10th International Conference for Information Technology and, Teacher Education.* San Antonio.
- Carey, S., and Crittenden, E. (1997). "Evaluating a Web-based generic, second language/culture methodology course". In P. Liddell (ed.) , *Foreign Language Education and Technology.* FLEAT. 3, 11-20.

- Crittenden, E., (1996). "Post-secondary English immersion". *MA thesis*, University of British Columbia.
- Fishman, J., (1966). *Language loyalty in the United States*. The Hague, Mouton.
- Netten J., (1999). "Intensity of instruction in FSL". *Paper presented at Canadian Association of Applied Linguistics Conference.*, Sherbrooke University.
- Lambert, W., Tucker, R., and d'Anglejan, A. (1974). "An innovative approach to second language learning: The St. Lambert experiment". In Carey, S. (ed.) *Bilingualism and Biculturalism in Education*, 47-55, University of Alberta.
- Stern, H.H., (1983). *Fundamental Concepts of Language Teaching*, Oxford University Press.
- Landry, R., Allard, R. and Theberge, R., (1991). "School and family French ambiance and the bilingual development of francophone Western Canadians". *Canadian Modern Language Review*, 47, 5, 878-915.
- Stern, H.H., (1983). *Fundamental Concepts of Language Teaching*, Oxford University Press.

TEND 2000

## Crossroads of the New Millennium

# Population, Labour And Education Dilemmas Facing GCC States At The Turn Of The Century

Prepared and Presented

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Seminar

# Abstract

This study attempts to describe and analyse certain population, labour and education issues in oil monarchies of the Gulf. The countries under consideration are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (further called GCC countries, after the organisation - the Gulf Co-operation Council - they established in 1981). Since the discovery of oil, these countries transformed themselves in a similar way from desert sheikhdoms into modern states. Oil revenues, and especially the high oil prices in the 1970s and the early 1980s, allowed for their rapid development. Social changes followed economic growth. Tribal societies, largely of rural or nomadic character, converted themselves into highly urbanised ones, a development that brought a complete change in people's lifestyles.

# Population, Labour and Education Dilemmas Facing GCC States at the Turn of the Century

## CONTENTS

- Population growth
- Nationals and expatriates
- Nationals and expatriates in the workforce
- Localisation of the labour market. The role of education and training
- Appendix: The localisation process in GCC states
- Endnotes

This study attempts to describe and analyse certain population, labour and education issues in oil monarchies of the Gulf. The countries under consideration are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (further called GCC countries, after the organisation - the Gulf Co-operation Council - they established in 1981). Since the discovery of oil, these countries transformed themselves in a similar way from desert sheikhdoms into modern states. Oil revenues, and especially the high oil prices in the 1970s and the early 1980s, allowed for their rapid development. Social changes followed economic growth. Tribal societies, largely of rural or nomadic character, converted themselves into highly urbanised ones, a development that brought a complete change in people's lifestyles.

## POPULATION GROWTH

The population of GCC countries rose from 4 million in 1950 to 27.7 million in 1997 – that is seven times (see Table 1).[1] In the United Arab Emirates (UAE), in less than half a century, the population increased almost 40 times.

Saudi Arabia has by far the largest population of the lower Gulf countries, being at any given time several times that of the combined population of the other countries. The exact size of the Saudi population has never exactly been known, with 1997/98 estimates ranging from 16.9 to 21 million. The sizes of the populations of Kuwait, Oman and the UAE are similar to each other - above 2 million in each country - while the populations of the two smallest states, Qatar and Bahrain, range between approximately 500,000 and 600,000.

### Table 1. Population growth, 1950-97

(in thousands)

| | 1950 | 1960 | 1970 | 1980 | 1990 | 1997 |
|---|---|---|---|---|---|---|
| **Bahrain** | 116 | 156 | 220 | 347 | 503 | 620 |
| **Kuwait** | 152 | 278 | 744 | 1,375 | 2,143 | 2,153 |
| **Oman** | 413 | 505 | 654 | 988 | 1,524 | 2,256 |
| **Qatar** | 25 | 45 | 111 | 229 | 490 | 522 |
| **KSA** | 3,201 | 4,075 | 5,745 | 9,372 | 15,800 | *19,500* |
| **UAE** | 70 | 90 | 223 | 1,015 | 1,589 | 2,696 |
| **GCC** | 3,977 | 5,149 | 7,697 | 13,326 | 22,049 | 27,747 |

***Source*:** Figures for 1970-1990 from *Gulf Statistical Profile*, p. 201; figures for 1997 – see Table 2 for details.

***Notes*:** Numbers in normal script – the official figures; numbers in italics - independent estimates.

Overall, the population growth rates in GCC countries have been very high, with these states accounting for the fastest growing populations in the world over the last few decades. Of course, the population grew faster in the first decades of development, and slowed down somewhat when major labour-intensive construction projects were completed. In terms of numbers, the average annual growth rate for GCC countries in the decade 1950-60 was 2.6 per cent; in 1960-70, 4.1 per cent; in 1970-80, 5.6 per cent; in 1980-90, 5.1 per cent, and in the 1990s, it has been 3.4 per cent. In late 1990s that high population growth has continued in all GCC states, ranging from 3 to 7 per cent annually.[2] These rates have been the highest in the Middle East and rank at the top world-wide (the annual average growth rate for all countries in the world was 1.5 per cent in 1995; 0.2 per cent for the 'more developed' countries and 1.9 per cent for those 'less developed').[3]

The population is expected to continue to grow. Most of GCC countries are likely to have doubled their populations within the span of a single generation. Taking the average growth rate of over 4 per cent as seen in the 1990s as a base, the total GCC population would reach 230 million in the year 2050.[4] Although it is very unlikely, even impossible, that such an increase will occur, these projections stress the seriousness of the demographic problems for the future of the GCC states.

## NATIONALS AND EXPATRIATES

In the past, the indigenous Arab populations of the Gulf countries were very small in number and local Arabs were in a clear majority among them. This population structure quickly changed after the discovery of oil because of the massive influx of foreigners necessary for its exploitation and the follow-up development.

In 1997, out of 27.7 million people living in the GCC states, about 17.1 million were nationals – that is 61.5 per cent of the total population, and about 10.7 million were foreigners, constituting 38.5 per cent (see Table 2 [5]). In Qatar and the UAE, nationals represented a small minority – around one-quarter of the population. In Saudi Arabia, Oman and Bahrain they constituted a larger proportion of the total population, but foreigners still make up a substantial part of the total numbers (30–40 per cent).

Overall, the population structure continues to be disadvantageous to the national populations. The percentage of nationals as part of the GCC total population declined from approximately 69 per cent in 1975 to 62 per cent in 1997.[6] Meanwhile, the percentage of expatriates grew in the same period from approximately 31 to 38 per cent. The UAE has become the only country where the share of nationals started to grow in the 1990s.

The average annual growth rate of national populations from 1985 to 1995 is 3.8 per cent, which is much lower than the previous decade when it stood at 5.8 per cent. The decline is mainly because of the lower number of naturalised persons in the later decade, as well as a lower birth rate, a phenomenon very typical of more developed countries.

The overall average annual growth rate of expatriate populations from 1985 to 1995 is 5.9 per cent, which although lower than in the previous decade (6.6 per cent), is still much higher than the comparable growth rates of the national populations.

As was the case for the total population, some projections can be also made for the future size of the national communities. Taking into account the most probable scenario - that is, an average annual growth rate for nationals of 3.5 per cent during the first decade after 1995 and declining by 0.5 per cent each subsequent decade - the GCC national population would pass the 60 million mark in the year 2050.[7] Projections for the expatriate community are, of course, much more uncertain, as their numbers can be decreased or increased rather quickly at short notice, in response to economic development and/or immigration and labour policies. Nevertheless, if the expatriate populations continue to grow at an average annual rate of 5 per cent, their size in the year 2050 would pass 130 million. The size of the expatriate community would be considerably lower if, as can be predicted, the growth rate continues to decline in the years to come.

The continuing rapid growth of national and expatriate populations constitutes a serious problem for GCC states. Despite huge oil and gas revenues, most of these countries find it increasingly difficult to cope with the costs of infrastructure development as well as the economic and social subsidies for enlarged populations. A former GCC Secretary General, Abdullah Bishara, has called this situation 'the greatest problem facing the Council'.[8] In Bahrain, Sheikh Mohammed bin Atiyatullah Al Khalifa, the Head of the Central Statistical Organisation, has warned: 'The population is growing at an alarming rate, and if this trend is not curbed, the consequences will have disastrous effects on services and limit job opportunities for the educated youth.'[9] The decision to significantly limit further population growth is, however, a difficult one to carry out as many nationals believe that the international prestige and security of their countries depend on the size of their population. They also view the population increase as a significant stimulus to economic growth.

**Table 2. Populations of nationals and expatriates, 1997**

| | Nationals | | Expatriates | | Total |
|---|---|---|---|---|---|
| **Bahrain** | *384,100* | *61.0%* | *236,278* | *39.0%* | 620,378 |
| **Kuwait** | 744,000 | 34.5% | 1,409,000 | 65.5% | 2,153,000 |
| **Oman** | 1,642,000 | 72.3% | 614,000 | 27.7% | 2,256,000 |
| **Qatar** | *157,000* | *32.7%* | *365,023* | *67.3%* | 522,023 |
| **KSA** | *13,500,000* | *69.2%* | *6,000,000* | *30.8%* | *19,500,000* |
| **UAE** | *658,000* | *24.4%* | *2,038,000* | *75.6%* | 2,696,000 |
| **GCC** | *17,085,100* | *61.5%* | *10,662,301* | *38.5%* | *27,747,401* |

*Source*: Bahrain – Central Statistical Organisation; Kuwait – The Public Authority for Civil Information; Oman – *Monthly Statistical Bulletin* (March 1998); Qatar – 1997 census estimates; Saudi Arabia – author estimates based on different reports[10]; UAE – the total population - Ministry of Planning data, *Annual Economic Report 1997*, breakdown for categories based on 1995 percentages.

*Notes*: Numbers in normal script – the official figures; numbers in italics - independent estimates.

In reality, pronatalist policies of GCC governments have enlarged the size of national populations. As substantial funds have been devoted to improving health services and promoting hygiene, proper nutrition and healthy living, infant and maternal mortality rates have fallen sharply, being about three times lower than world's average at the beginning of the 1990s. Meanwhile, life expectancy at birth has gone up considerably, rising by some 20 years in the last few decades and being about ten years above the world's average.

## NATIONALS AND EXPATRIATES IN THE WORKFORCE

The dominance of foreigners is even more pronounced in the labour market than it is in the total population. In the GCC states, in 1997 there were some 7.5 million working expatriates as opposed to 3.2 million nationals (see Table 3). Expatriates constitute a majority of the labour force in each country with an overall average of 69 per cent, reaching as high as 80-90 per cent in Kuwait, Qatar and the UAE. The lowest rate is that for Bahrain and Saudi Arabia, but even their expatriates still constitute over 60 per cent of the workforce.[11]

The expatriate share in the total workforce went up from about 51 per cent in 1975 to about 72 per cent in 1985. Only more recently, the situation begin to change, and the average expatriate share in the overall workforce decreased slightly to 70 per cent.

Conversely, the percentage of nationals in the workforce has decreased from 49 per cent in 1975 to about 28 per cent in 1985, only to shift slightly upwards to approximately 30 per cent by 1997.

The demand for foreign labour has continued along the GCC countries' development. Moreover, the expatriate inflow has been a self-feeding process. The employment of foreign workers increases the need for housing, services, consumer goods and so on, creating an additional demand for manpower that can be met only by more immigration.

The situation within labour markets has, of course, always depended on the state of the economy. Nevertheless, even when oil prices have declined, or when regional wars have required large, unplanned spending, GCC countries have had to adjust their development policies only to some extent. As a result of their huge capital reserves, it has usually been enough for them to temporarily cut some expenditure and limit certain projects. Only Bahrain has been the exception to this rule, often facing serious economic and social problems because of the lack of oil and due to Shi'ite-related unrest within the country. This situation, however, may change overall in the future as oil wealth continues to be in decline, at least in relative terms. Oil revenues in the 1990s constitute only about 30-50 per cent of the per capita level GCC countries experienced during the peak in the 1970s. Coupled with further population growth, this diminishing trend is likely to continue. Therefore development of human resources will remain particularly crucial to the overall development process.

**Table 3. Nationals and expatriates in the workforce, 1995-97**

| | Nationals | | Expatriates | | Total |
|---|---|---|---|---|---|
| **Bahrain** | 103,500 | 38.1% | 168,500 | 61.9% | 272,000 |
| **Kuwait** | 188,800 | 16.0% | 991,200* | 84.0% | 1,180,000 |
| **Oman** | 270,000 | 35.2% | 496,200 | 64.8% | 766,200 |
| **Qatar** | *22,000* | *18.4%* | *98,000* | *81.6%* | *120,000* |
| **KSA** | *2,500,000* | *35.7%* | *4,500,000* | *64.3%* | *7,000,000* |
| **UAE** | 124,420 | 9.6% | 1,165,234 | 90.4% | 1,289,654 |
| **GCC** | *3,208,720* | *30.2%* | *7,419,134* | *69.8%* | *10,627,854* |

***Source*:** Bahrain (1996) – Ministry of Planning; Kuwait (June 1997) – Public Authority for Civil Information; Oman (1995) - Ministry of Development estimates, *Five-Year Development Plan 1996-2000* (Muscat, 1996); Qatar (1996) – estimates based on 1994 figures for total workforce, *FAO Production Yearbook* and EIU *Country Profile 1996-97*; Saudi Arabia (1997) – Ministry of Labour and Social Affairs estimates; UAE (1996) – Ministry of Planning.

*Notes:* With so-called *bidoons*. Numbers in normal script – the official figures; numbers in italics – the independent estimates.

The supremacy of foreigners in the populations and labour markets of the GCC states has very serious security, political, economic, social and cultural implications. First of all, the authorities are afraid that their dependency on expatriate labour could lead to vulnerability in their governing systems. As many expatriates originate from the most politicised countries in the Middle East or from not necessarily friendly neighbouring states, the authorities have been worried about them working as a 'fifth column' for foreign powers and about them spreading radical foreign ideologies, which often propagated the overthrow of governments. Second, the expatriates' huge hard currency remittances have a negative impact on the GCC economies. Then, the negative impact of Westernisation on national cultures, on identities and values as well as on social structures, remains a big concern. In particular, authorities are worried about the influence on local children from their Asian nannies or from the expatriate teachers who form the majority of the staff in local schools. They are also unhappy at the growing influence of foreign media and of foreign women married to nationals. Jamil al-Hujailan, the Secretary General of the GCC, stated in October 1998, that 'the problem of expatriate workers is starting to represent a danger for GCC nations'.[12] According to him, 'they pose grave social, economic and political problems that could grow more complicated in the future' and the only solution to those problems 'is to replace expatriate workers with nationals'.

The regimes' response to these threats has been to maintain as tight a control over the immigrant population as possible and maintain their separation from the rest of the population. The authorities have also been trying to limit the negative impact of foreign cultures by promoting the education of nationals, and by stressing the importance of maintaining Islamic values and Arab identity.

## LOCALISATION OF THE LABOUR MARKET. THE ROLE OF EDUCATION AND TRAINING

Localisation (often also called nationalisation or indigenisation) and its specific variations (Omanisation, Kuwaitisation and so on) are the terms used in GCC countries to describe policies leading to the replacement of expatriate labour by nationals. Authorities in all these states try to implement such policies, as their constitutions require them to provide jobs for all citizens, and also because they well understand risks coming from the existence of large communities of foreigners on their territories.

On the long list of problems related to the dominance of expatriates, one of the most pressing is the issue of unemployment of nationals. This new phenomenon has developed as a result of the inability of the already saturated public sector to continue to hire the growing number of nationals entering the job market. At the same time, nationals face restrictions in seeking employment in the private sector because of its competitiveness. Moreover, some of them are subject to changing social relations, as young nationals cannot rely on family support as much as before. The problem of unemployment of nationals in GCC countries is, of course, different in nature from that in most other countries of the world. It is a 'masked' unemployment as, simultaneously; these countries employ millions of foreign workers. Thus, it is more a question of integrating the national workforce into the labour market than the necessity to expand the economy and create new jobs.

The actual extent of unemployment among nationals is hard to estimate. The official figures are usually very low, while independent estimates, in contrast, are alarmingly high. For example, the UN Economic and Social Commission for Western Asia reported a rate of 14.8 per cent overall unemployment in GCC countries in 1991, and stressed that this figure does not reflect a widespread disguised unemployment of nationals in the public sector and voluntary unemployment from the unavailability of 'preferred' jobs.[13] Whatever the real figures, the problem of unemployment of nationals has been steadily growing. One reason for that is the population growth. The 15 to 30 age group is the fastest growing segment of the GCC population and half of the population is under the age of 15. This means that, in the next ten years or so, hundreds of thousands of young nationals graduating from schools will be looking for suitable employment opportunities. They will be better educated and have greater expectations. Another reason for unemployment is nationals' work ethic. Nationals are often disinclined to enter low-skilled posts while, at the same time, the educational systems are not well equipped to deal with the problem of how to reorientate traditional work values. In the majority of cases, nationals are ready to enter only occupations that are culturally acceptable, high in social status, typically 'modern' and connected with the white-collar environment. Such jobs are now usually not available, as public sector became saturated already.

Whatever the reason for unemployment of nationals, GCC governments have to find jobs for all of them. This will only be partially possible through the creation of new work places. To a large extent, it can be accomplished by the replacement of expatriates employed in the private sector. The authorities thus have to devise a system of teaching, recruiting, selecting, placing and training nationals, to suit the requirements of this highly competitive sector, while at the same time reducing the dependency on expatriate labour in such a way as not to affect the countries' development.

In an attempt to localise the workforce successfully, GCC governments have introduced various policy instruments affecting the quantity of the national labour (quotas and employment targets), prices (wage subsidies to the private sector, government wage restraint and fees, and charges on foreign labour), as well as quality of it (education and training of nationals). The earliest measures applied were ones to guarantee the employment of large numbers of nationals. Laws were enacted giving nationals a priority in the labour market: an expatriate cannot be employed if a national with the required qualifications can be found. In the public sector, this law, of course, has been easy to execute. Employment in this sector was also met with great interest among nationals because of the prestige associated with the job, a non-competitive environment, and the fact that it has usually offered better salaries and less demanding work than the private sector. Therefore, the degree of localisation of the public sector has been high, ranging now from 40 per cent in the UAE and Qatar to 60-70 per cent in Oman and Kuwait and 90 per cent in Bahrain and Saudi Arabia.[14] Additional to quantity, thanks to the specific policies of the authorities, nationals have been put in top positions in the government (especially in ministries, the military and security services) as well as in the economy (especially in oil firms and banks because of their strategic importance). In reality, nationals are chief executive officers in almost all state-owned companies as well as heads of companies' branches and departments.

The process of localisation of the public sector, though much advanced, has not yet been fully completed. Even the armies in several GCC states continued to employ foreign mercenaries in the 1990s. The judiciary also has not yet been able to fully nationalise itself and most of the judges are still foreign.

In turn, in the private sector, the law giving nationals priority over expatriates has very rarely, if ever, been practised. Different obstacles created by private employers and lack of interest among nationals to look for jobs in this sector have caused its localisation to become very low in most of GCC states, with only Bahrain and Oman crossing the 30 per cent level. In Saudi Arabia and the UAE only 7-8 per cent of nationals work in the private sector.[15]

Employment in the private sector is usually not an attractive proposition for nationals as the salaries offered may be low, working hours long and the work environment difficult to accept, with its competitiveness and the necessity of accepting an expatriate supervisor. Moreover, working in the private sector, in contrast to the public one, is sometimes perceived as detrimental to nationals' social status, because under existing salary conditions such employment cannot guarantee compatibility with the image the consumer-orientated society has created for them.

To change this situation, in the 1990s GCC governments began to introduce quota systems for nationals in the private sector. They have either been applied universally or to selected occupations only. Companies were asked to reach specific localisation targets by certain dates or face heavy fines, the denial of visas for their new foreign employees or loss of public contracts for failing to comply. Moreover, some professions have been restricted as being 'for nationals only'. Nevertheless, in most cases companies have not fulfilled the legal obligations: publicly they claim a lack of sufficient number of nationals to take over jobs from expatriates; in reality they have used this argument as an excuse not to implement these rules.

A forceful approach to localisation, like the quota system, has been criticised as potentially harmful to the economy, at least in the short run. It may, after all, negatively affect the productivity and profitability of local firms, making them less competitive. The UN's Economic and Social Commission for Western Asia even warned GCC governments that forcing the private sector to employ nationals could adversely affect economic performance.[16] Similarly, according to International Monetary Fund economists, the imposition of quotas and administrative regulations could ultimately be counter-productive.[17] Also local experts have criticised many aspects of localisation. Henry Azzam, the chief economist at Saudi Arabia's National Commercial Bank, stated that localisation is 'forcing inefficiencies on the private sector'. 'It is telling the private sector that costs will go up ... The logical way would be to allow the choice of whom to employ.'[18] Many private businessmen share such opinions, claiming that they should not be forced to employ nationals above their market value, as otherwise they would incur unjustifiable losses.

To help nationals find proper employment, special attention has been devoted to the issue of education and training. All GCC countries have achieved substantial progress in education in the last few decades. In particular, nationals' illiteracy rates have substantially decreased (although they are still high by international standards, ranging from 15 per cent in Bahrain to 37 per cent in Saudi Arabia).[19] New schools, colleges and universities have been opened, and women have started to be admitted to all of them. At the same time, however, the educational system has not yet adapted well to the needs of modern economic development. As interaction between planners of education and planners of the economic and labour markets have usually been limited, educational systems have particularly failed to provide an adequate number of accountants, business managers, engineers, computer specialists, doctors, nurses or teachers. For example, in the early 1990s, 37.5 per cent of graduates of the GCC schools completed work related to social and Islamic studies, 34 per cent in education, and only 18 per cent in technical fields and 10.5 per cent in business administration.[20] While general secondary education, perceived as relatively easy and appropriate, has always secured nationals a good government job, vocational education has been held in low esteem and science studies have been regarded as unnecessarily difficult. Moreover, as Ali M. Al Towagry, Director General of the Riyadh-based Arab Bureau of Education for the Gulf States, stated, most of the schools in GCC states have not been up to standard to say the least, with the programmes offered being 'predominantly theoretical and book-oriented'.[21] Abdallah Mograby from the Emirates Centre for the Strategic Studies and Research added to this evaluation, pointing out that 'too many educators are still using obsolete approaches, such as a heavy emphasis on memorisation instead of techniques designed to develop innovative thoughts … with students lacking access to computers and technology'.[22] What has made the situation at schools even worse is the typically weak management of them, the employment of 'second category' teachers, large classes and a lack of co-operation with parents. As a result, there has been a high repetition of grades and a high dropout rate of national students despite the fact that graduation standards have been rather low.[23]

There has also been an important problem of how to combine a need to produce a modern, mainly Western-type of highly trained and motivated industrial workforce with the obligation of maintaining in this process traditional Muslim values. As Munira A. Fakhro described, the educational systems in the West win popular approval by avoiding indoctrination, and the students who learn to reason, win praise and climb to power in a technological society.[24] In the Gulf States, however, where Islamic teaching often dominates the educational systems, well-educated people are believed to be those who have learned the word of God. Students who prove their ability to memorise revealed truth correctly, and who can quote it in appropriate contexts, win acclamation and respect. Science must accommodate to this. As a result, schools often have problems to prepare students well for the requirements of modern economies.

As recently as the 1990s, GCC countries started to introduce meaningful changes in their educational systems. More modern curricula have been implemented, in particular stressing the importance of computer literacy and emphasising the English language as the basic means of communication in the contemporary world. Nation-wide, standardised exams have also been introduced. Moreover, many new technical and vocational schools have been opened and job-orientated programmes promoted. At the same time, interest in vocational training among nationals has increased, as they begin to see the link between the growing number of unemployed people and their lack of adequate skills to meet labour market demands.

The other category of means adopted by the authorities to increase the localisation of the workforce consists of various financial incentives. In some GCC countries, governments started to give grants to private companies for each employed national, usually designed to cover the costs of their training. Not having their own financial resources, young nationals are provided with preferential loans to set up their own businesses. Pension schemes for nationals employed in the private sector have been introduced. The employment of nationals has also been promoted by giving priority to well-localised companies during state contracting by tender or in dealings with ministries of labour. Finally, proposals to subsidise salaries of nationals undertaking jobs in the private sector have also been formulated (including taxing foreign workers to obtain additional funds for that purpose).

In an attempt to accommodate the labour needs of nationals and to reduce their unemployment, GCC governments are not restricting themselves to the idea of replacing foreign manpower by the local one. They have also tried to find jobs by sending some nationals employed in the public sector to early retirement and by developing and restructuring industry. In particular, there are plans to replace low-tech, labour-consuming technologies based on the availability of low-paid foreign manpower with high productivity ones, which do not require a large number of imported workers, and which can attract nationals through good salaries and a prestigious high-tech environment.

One of the main obstacles to localisation of the workforce in GCC states is the limited overall size of the indigenous population. In small countries, such as Qatar, the number of jobs available (and necessary) to develop the country according to existing financial means exceeds the number of nationals. In this situation, the issue of employment of national women acquires special importance. In addition to the fact that their number can make a difference in itself, some experts believe that national women are also more cost-effective compared to national men or even expatriates. They can also take some jobs that national men would be reluctant to accept - such as secretarial or administrative positions in schools or hospitals. Therefore, the authorities in several GCC countries began to promote the employment of national women, seeing it as a significant means of limiting the size of the expatriate labour.

Another problem for localisation is attitudes of private employers toward it. For many of them localisation is nothing to be happy about as there are very few incentives to hire nationals. Nationals are well protected by labour laws (in contrast to expatriate workers). In particular, they cannot be dismissed at the will of the employer, even if they do not work hard or are often on sick leave. They are not willing to accept certain types of job and resign if they are not satisfied. They need to be trained, as usually they lack the required skills and experience as well as a modern work ethic and motivation. They expect high salaries but short working hours and a single shift. Finally, they are less productive and therefore more expensive per unit of time than an expatriate.

The last argument - that employing nationals is more expensive than foreign workers - is, however, challenged by the authorities. Of course, it is true that Asians and non-Gulf Arabs are ready to work for much less money than nationals (because of different lifestyles and the huge disparities existing between the costs of living in GCC states and in their home countries). Though the overall cost of employing expatriates is comparable with that of hiring nationals because of the additional expenses associated with employing foreigners, these additional costs are often not taken into account (such as services provided for them that are subsidised by the state). Moreover, the national economy benefits from employing nationals as the money they earn remains in the country and is not remitted abroad as is the case with expatriates. For example, expatriates in Saudi Arabia in 1996 remitted US $18.6 billion abroad, which was representative of about 10 per cent of the GDP of the Kingdom.[25]

In general, to overcome existing difficulties, all three actors on this scene - the government, the private employer and the national employee - have to come to some basic agreement over their priorities. Governments have to commit themselves to localisation programmes much more than before and consequently implement the approved plans. In turn, private employers have to include in their reasoning some long-term national priorities and stop making decisions based just on short-term financial benefits for themselves. Finally, individual nationals have to realise that the times of the welfare paradise have come to an end and that they must give more from themselves to secure their well being.

A step in this direction has been made during the decade of the 1990s. Localisation has become a very important national issue and has figured prominently in the strategic objectives of forthcoming development plans. Governments in several GCC countries have established high-ranking bodies - such as the Vocational and Training Authorities or the Manpower Councils - to integrate and make more efficient all the efforts undertaken by different ministries and agencies to localise the workforce. Special state-run offices for the employment of nationals were also opened. Moreover, GCC leaders have started to discuss this issue in their summits. The original GCC Statement on Objectives and Policies of Development provided a number of goals for national manpower development, such as enhanced educational opportunities, better health standards and better work conditions.[26] More recently, during the 1997 summit, a resolution was adopted by GCC rulers stipulating that the level of a company's job localisation should be the criterion for giving loans, tenders and other incentives to both local and foreign companies, and that the nationalisation drive should cover both public and private sectors. In turn, in the final communiqué of the 1998 summit in Abu Dhabi it was stressed that 'the GCC is working to strike a balance in the demographic and labour structure so as to guarantee harmony in the communities of the GCC to preserve its Arab and Islamic identity and to increase national participation in the economic life'.[27] Along with these policies, the GCC Supreme Council assigned to the newly formed Consultative Council the task of studying ways of providing jobs for nationals.

The problems outlined above clearly point out that GCC states face a formidable set of challenges in the twenty-first century. Population, labour and education dilemmas will not be easy to solve in a short period of time. They will require a lot of commitments and sacrifices. In particular, as Sheikh Mohammed bin Rashid Al Maktoum of Dubai said recently: 'To correct the demographic structure will take at least between 15 and 20 years' and 'It is not wise to do it in haste.'[28] In mean time, researchers and experts should study all these processes - not only to answer locally addressed problems but also to formulate and check important theoretical hypotheses of human development.

# APPENDIX

## THE LOCALISATION PROCESS IN GCC STATES

Despite attempts to co-ordinate localisation policies, they have been rather different in particular GCC countries and applied with varying degrees of commitment.

### BAHRAIN

Bahrain has the highest percentage of nationals in the workforce among GCC states, accounting for 38 per cent of the total in 1997. Although 90 per cent of nationals are employed in the public sector, they also constitute as much as 32 per cent of the private sector workforce. For example, in the oil and aluminium sectors, the percentage of Bahraini workers reached 88 per cent in 1996; they constituted about 80 per cent of the banking staff and accounted also for 65 per cent of doctors and 45 per cent of nurses in government hospitals.[29] Despite these positive signs, the overall picture is not very optimistic. The percentage of nationals in the workforce continues to slide. The number of jobs available in the market declined as the performance of the economy worsened in the 1990s, mainly because of Shi'ite-linked tensions. Unemployment of nationals remains high, being estimated at 10-15 per cent (although the government maintains that it is low, about 2 per cent).[30]

The unemployment problem can be well illustrated by the situation in the education sector. The teaching staff in government schools is practically fully nationalised already (over 90 per cent) and cannot employ any new Bahrainis. At the same time the level of Bahrainisation in private schools is very low (some 8.5 per cent), but inadequate qualifications and salaries prevent newly graduated national teachers from finding work there and, as a result, they join the army of unemployed.[31]

To localise the labour force further, a far-reaching law was passed in 1995 requiring each newly established enterprise to employ 15 per cent of nationals during its first year of operation and 25 per cent during the following two years. Private sector firms that employ ten or more people have been obliged to raise the percentage of nationals by 5 per cent each year until they reach 50 per cent. Firms with fewer than ten workers must employ at least one Bahraini besides the employer. Companies tendering for government contracts must keep to the specified percentages if they are to succeed, and they must use money that would otherwise be spent on importing labour on training programmes for nationals. Moreover, any new project must be started with at least 20 per cent of those involved being Bahrainis, with an annual 5 per cent increase then applying. Nevertheless, enforcing this law proved difficult, and so far only a few companies fulfilled its requirements. For a national to find employment in the private sector remains a difficult task. According to the study conducted by the Ministry of Labour and Social Affairs, private sector firms took the salaries of expatriate labour as the basis for deciding the wages for Bahrainis, making it impossible for them to find jobs that would allow them to meet their living standards and necessities.[32]

In such a situation, special efforts have been made to develop the training of nationals for industry and commerce. For that purpose, consequently, the National Manpower Council, the Supreme Council for Vocational Training and, finally, the Manpower Development Directorate were established. These institutions began to offer numerous vocational programmes for men as well as special handicraft courses for females. At the same time, several training institutions have been opened. The state-run Bahrain Training Institute became a role model for vocational training, increasing the number of trainees each year and broadening the scope of programmes offered. The Bankers' Training Centre also became successful, preparing nationals for jobs in the financial sector and being financed by a levy on banks operating in the country. The successes of these centres encouraged the government to establish similar training institutions in other sectors of the economy. Some large companies, such as Bahrain Petroleum, Bahrain Communication and Aluminium Bahrain, opened their own training centres and were exempted from the levy for that purpose. To encourage companies further to undertake such actions; the Council for Vocational Training proposed recently a plan, likely to be adopted, under which a company will receive bonds for every job seeker it trains. The bonds will be financed by increases in charges for new and renewed work permits for expatriate workers. Moreover, a much higher Bahrainisation target for private establishments - 75 per cent - was proposed, as well as that wages for Bahraini workers should not be less than 51 per cent of the total salaries paid by the companies.[33] The government, however, is aware of the fact that in the short term it will be difficult to find enough jobs for all nationals in the country (around 6,500 young Bahrainis enter the labour market each year). It has therefore also been encouraging civil servants to take early retirement. To speed up this process pension payment has been raised. Moreover, the authorities have begun talks with other GCC states, the UAE in particular, to find ways to place Bahrainis in work abroad.

## KUWAIT

In Kuwait, nationals comprise only 16 per cent of the workforce and their share in it continues to decline. Moreover, the overall situation for nationals in the labour market is worsening. For example, about 150 nationals graduating as engineers and over 500 other diploma holders were unable to find jobs each year in the mid-1990s.[34] In relative terms, however, unemployment in Kuwait is not such a big problem yet. It is estimated to be between 1 to 2 per cent.[35] A much bigger problem, however, has been underemployment within the public sector (the so-called 'masked' unemployment of Kuwaitis is estimated by some experts at 50 per cent).

Nevertheless, according to Kuwaiti authorities, the public sector can still absorb many nationals. They realise, however, that localising it is very costly. The Minister of Planning and Minister of State for Administrative Development, Ali Fahd al-Zumai, told parliament in January 1997 that 36 per cent of expatriates working in the public sector account for only 13 per cent of the total salary bill.[36] Replacing them with nationals, who would need to have higher salaries, would require a substantial increase of the budget, which already faced a deficit. Another problem is the low level of education and lack of appropriate skills of many Kuwaitis. As the Minister revealed, 44 per cent of nationals employed in the public sector did not have a secondary school certificate and only 20 per cent held university degrees. One reason for this situation is that, although education is compulsory and free for all residents of Kuwait, the quality of education in public schools is low. Even the graduates of Kuwait University find it difficult to compete for a job outside the public sector. In addition, a limited number of technical and vocational schools, guided by the General Commission for Applied Education and Training, have not been able to fill the demand for skilled labour, even for the prioritised oil industry. As a result, many Kuwaitis entering the workforce are effectively semi-skilled and able to fulfil only basic clerical or manual jobs.

Despite all these obstacles, the authorities are planning to replace 10 per cent of foreigners in the public sector by nationals each year, as well as reducing the yearly budget allocation to non-Kuwaiti labour by a similar percentage. In turn, to increase the localisation of the workforce in the private sector a number of far-reaching measures have been proposed by the government: establishing the minimum percentage of Kuwaitis each company is required to have; a time frame for replacing the remaining expatriate staff in the ministries with nationals; incentives for training nationals; subsidising the salaries of Kuwaitis in the private sector and linking facilities granted to a private business with the number of Kuwaitis it employs. When such proposals will be implemented is, however, difficult to predict as in Kuwait they require the acceptance of parliament where there is always some opposition against such measures. Many parliamentarians represent the interests of private business, which is not necessarily consistent with the overall national goals. In effect, the only measure effectively adopted so far to alleviate the situation was the establishment of the special fund to help nationals open small business enterprises if resign from the public job. To overcome clashes with parliament, the Emir of Kuwait issued some decrees when parliament was dissolved in May 1999. Private firms with a capital over 500,000 dinars would have to pay 2.5 per cent of their net profits into a special fund, which will subsidise Kuwaitis employed by the private sector. Moreover, the state would pay unemployment insurance to any of the Kuwaitis who failed to find jobs. A quota system for nationals in the private sector would also be established. Penalties would be enforced against firms that failed to meet the requirements, while state tenders would give priority to firms that met them.

## OMAN

Oman, like Bahrain, belongs to the group of less-rich monarchies. As a result, many nationals can be found in various jobs and overall they comprise about 35 per cent of the labour force.

The localisation of jobs in Oman was put on the government's agenda very early. The Education and Training Council chaired by the Sultan was established in 1977. The Ministry of Social Affairs and Labour, through its Directorate General of Vocational Training, established several Vocational Training Institutes in different regions of the Sultanate in the mid-1980s. Oman Technical and Industrial College, the Institute of Health Services, the Institute of Public Administration and the Institute for Bankers were also set up. State-owned oil companies - such as Oman Petroleum Development and Oman Refinery Company - established in-service training and educational programmes for their Omani employees. At the same time, the authorities began to involve the private sector in such programmes. The Training-Levy Rebate Scheme was introduced to reimburse private employers for the costs of training courses for Omani nationals.

The first sector the government decided to nationalise was banking, attractive for nationals because of high salaries and the prestige associated with the job. Omanis quickly dominated this sector and in the 1990s constituted 85 per cent of all bank employees. Programmes to Omanise fully some other sectors - nursing, for example - were established as well. At the primary school level, 95 per cent of teachers are already Omanis; in the whole public school system 57 per cent of teachers are nationals.[37] By 1997, about 70 per cent of all government employees (excluding military) were Omanis, with several government departments becoming almost 100 per cent localised.[38]

In 1994, Oman became the first country in the GCC to introduce legal requirements for the localisation of the private sector. The Ministry of Social Affairs and Labour imposed an Omanisation percentage according to a sectored quota system: banking - 90 per cent; transport, storage and communication - 60 per cent; finance, insurance and real estate - 45 per cent; hotels and restaurants - 30 per cent; wholesale and retail - 20 per cent; and contracting - 15 per cent. Several categories of jobs, such as fishing, animal husbandry, driving light vehicles or practising traditional handicrafts, were reserved for nationals only. The plan aims to increase the percentage of Omanis in the private sector to 27 per cent by the year 2000 (from 17 per cent in 1995). This would bring the overall localisation of the workforce to 40 per cent.

Companies were originally asked to reach the targeted percentages by the end of 1995 or face heavy fines, the denial of visas for importing labour and the loss of public contracts for failing to comply. Nevertheless, the implementation of this ambitious programme had to be postponed. Most of the private companies were not ready to fulfil the legal obligations, claiming a lack of sufficient numbers of properly skilled Omanis to take over jobs from expatriates. The truth, however, was that all too often, private companies did not take the issue seriously and did very little (or nothing) about it. A major problem has been the different salary expectations between expatriate and local labour. Many expatriates from Asia are ready to work for 60 rials (US$160) a month while the minimum wage required for an Omani secondary school graduate is 200 rials (US$550). Of course, private companies prefer to employ the former. Nevertheless, thanks to the government involvement, 20,000 Omani nationals replaced expatriates in the private sector in 1998, with a target for 1999 being set at 25,000.[39]

In the Fifth Five-Year Development Plan (1996-2000) it was stated that there was a need to attach greater importance to human resource development. This means 'upgrading and developing ... basic education to the level of distinguished international standards', and 'expanding the area of technical education and vocational training, and directing most of the basic education graduates towards these areas'.[40] To fulfil these goals, the Supreme Committee for Vocational Training and Labour was established (replacing former bodies of this kind). Ministers of national economy, commerce, industry and development became its members. The Committee's executive arm, the Vocational Training Authority, has been entrusted with the task of initiating programmes to increase the number of trained professionals and technicians. Thanks to the Authority's initiatives, several technical colleges and vocational training centres have been established. Moreover, significant budget allocations have been made since 1996 for training schemes for nationals, including those for women. The government has also decided to use for that purpose funds generated from the tax imposed on companies for hiring expatriate workers. Additionally, the authorities have expanded earlier schemes and have begun to reimburse private companies for employing Omanis, covering the entire cost of their in-job training and 50-80 per cent of their salaries for the first few months.

The Vocational Training Authority has adopted the British National Vocational Qualification System to help boost human resources development. It puts equal emphasis on real-life experience and classroom theory, and to a large extent tackles satisfactorily the problem of secondary school leavers. Only those educational institutions that satisfy the system's requirements are entitled to apply for government subsidies. To expand educational possibilities further, as Sultan Qaboos University and a few other existing public colleges are only able to enrol 15 per cent of high school graduates; the establishment of private colleges has been allowed.

Other actions have also been initiated. First of all, in 1997 the Omani government decided to require the early retirement of more than a fourth of its Civil Service and to secure in such a way a number of jobs for young nationals. Second, 1998 and again 1999 were proclaimed as the Year of the Private Sector, with the aim of promoting further development of this sector and the localisation of private establishments. In particular, companies employing a large number of Omanis and organising training programmes for them became eligible for special 'green cards' from the Ministry of Social Affairs, Labour and Vocational Training, giving them priority in expediting their labour-related transactions at the Ministry. To help create new jobs for graduates, the Fund for the Development of Youth Projects was launched in 1998. Sultan Qaboos and other members of the royal family were the first donors to the fund. Finally, a decision was made to implement strictly the 1994 law, and fine establishments that did not meet the quota requirements. Gas stations were the first companies where this measure was adopted. The authorities suspended labour cards of expatriate employees in gas stations that were not 50 per cent Omanised. In the step that followed, all school bus and tractor driver positions were set aside for nationals. Barbers, tailors and gas cylinder distributors were added to the list of occupations reserved for Omanis only. Moreover, the government asked all private companies employing 50 or more local workers to have an Omani director of personnel by the end of 1999 and announced that it would no longer grant expansion loans to companies that had not reach Omanisation targets.

Despite all these efforts, unemployment among nationals is currently about 12 per cent. The authorities revealed that, in 1998, the number of Omanis seeking jobs was over 30,000.[41] The attitude of young Omanis towards jobs has not always changed. Young people still prefer to work in the ministries or to begin their careers in high managerial posts. Even when they realise that this is not possible, and face unemployment, they not necessarily apply for technical or clerical jobs outside the public sector. The Minister for Social Affairs, Labour and Vocational Training, Amor bin Shuwain Al Hosni, appealed to them recently, saying that Omanis should seize the jobs that are available rather than wait for the choicest ones. 'We cannot wait for foreigners to cook for us, drive our cars and tailor our clothes … no work is inferior.' [42] Sultan Qaboos went even further and denounced what he called 'the laziness' of the present generation, which is no longer willing to perform manual labour.[43] At the same time, the Chairman of the State Council, Sheikh Hamoud al-Harifhi, warned men in Oman 'against the consequences of their laziness, because women are taking their due role in all ministries, establishments and areas of production and are scoring superior positions'.[44]

Localisation in Oman faces a number of problems. In a study by Asya Mohamed Suleiman Al-Lamky, 65 per cent of Omani graduates indicated that they were not able to replace expatriates at work due to lack of appropriate education and training.[45] According to Fawzia Al-Farsi, the major obstacles to Omanisation are: lack of awareness among expatriates of their responsibility to train nationals and inadequate co-operation from expatriates in this respect as a result of their fear of losing employment, lack of clear policy and Omanisation targets; continued preferential treatment of expatriates over Omani nationals in the private sector; insufficient opportunities for Omanis to be given responsibility at work, inappropriate Omani work attitudes and limited commitment.[46] Moreover, the localisation of the workforce in Oman, as in other GCC countries, has not been welcomed by everybody. Some businessmen have expressed their criticism of enforced localisation. They believe that 'Omanisation cannot be based on converting the private sector into charitable institutions, forcing it to absorb nationals'.[47] Others point out that localisation should not be speeded up as this may cause serious problems; for example, as was the case when expatriate water-tanker drivers were replaced by nationals, resulting in a poor supply of water.[48] On the other hand, there has also been criticism that localisation policies have not been enforced firmly enough. In 1998, the President of the Shura Council, Abdullah bin Ali Al Qatabi, called for a review of Omanisation policies, since an increasing number of expatriates have continued to arrive in the Sultanate to take up employment.[49] Nevertheless, in comparison with other GCC states, the localisation of the Omani workforce has been quite successful so far.

## QATAR

In Qatar, the very small national population and the huge investment projects related to the development of gas fields made the existence of foreign labour in the 1990s even more necessary than was the case of some other GCC countries. It is highly unlikely, then, that substantial nationalisation of the workforce will be possible in the foreseeable future. At the moment, even in the public sector, Qataris do not form a majority of the workforce - they constitute only about 45 per cent of the total. Nevertheless, the government, which is aware of the problem of expatriate dominance, has been taking some actions to maximise the national potential. Certain legal and financial incentives have been introduced to increase the number of Qataris in joint-venture industries and government departments. The authorities are also seeking to reform the weak educational system and to focus on job-related skills. For that purpose, the ten-year plan of co-operation between the University in Doha and the government was signed in 1995. It requires the creation of many academic programmes directly linked to the needs of Qatar's expanding economy. The specialised College of Trade and Industry and Qatari Technical College were established. To attract Qataris to enter technical jobs, the government has decided to pay salaries to students who take industrial training courses. To promote higher education, the first graduates from the university were given top jobs in government ministries despite their lack of experience.

Localisation in Qatar is limited and it will remain slow. According to Dr. Abdulrahman Hassan Al Ibrahim, Vice-President of Qatar University, there are several reasons for this situation. 'Firstly, until recently, the civil bureaucratic sector has been able to absorb most of the national labour force; secondly, reliance on the extended family has made it normal for young Qataris to rely on their parents wealth, and thirdly, there is still a lack of appreciation of vocational jobs.' [50]

## SAUDI ARABIA

In Saudi Arabia, the necessity of localising the workforce was recognised very early. The Labour and Workers Regulations issued in 1969 stipulated that 'every employer shall improve his Saudi workers' level of technical proficiency in order to enable them to be sufficiently qualified in their occupation so that they can replace non-Saudi workers; he shall prepare a register wherein he shall enter the names of Saudi workers who have replaced non-Saudi workers, according to terms, rules and time limits prescribed by the Labour Minister ...' [51] The government decreed in 1970 that 75 per cent of the workers of all businesses operating in the country should be Saudi and that they should receive at least 51 per cent of the company's total compensation.[52] To tackle the problem of national human resources development, the Manpower Council was established in 1980. The consecutive Five-Year Development Plans envisaged the creation of new jobs for nationals, including women, and the substantial reduction of dependence on foreign manpower. In particular, the Third Development Plan (1980-85) assumed that in the government sector all 'fit and able' young Saudis occupying unskilled non-cadre positions would be progressively sent to career development educational programmes.[53] At the same time, the authorities planned to ask the private sector to develop training programmes, and to give any significant government loans conditionally on the company's training schemes organised for nationals. To encourage Saudis to participate in such programmes and seek employment in technical and skilled jobs, the government intended to introduce a system of incentives for them. According to the Plan, the school curricula were to be reviewed 'to better serve the changing needs of society and economy'. Grants for university students were to be limited to those who maintained a good level of proficiency, and who were specialising in subjects that were considered to require extra encouragement. Areas of work for women 'which do not conflict with the principles of Islam' were also to be identified. The last Plan, for the years 1995-2000, called for the creation of 659,900 new jobs by the end of the century, not least because around 120,000 new graduates leave schools every year looking for jobs, including 30,000 college or technical institute degree holders.[54] Some 319,500 of these new places are to come from the replacement of expatriates and the rest from the creation of new jobs, mostly in industry. In reality, however, many of these ambitious plans did not materialise. Consecutive Developments Plans had to address them over and over again as applied strategies either failed to work or were never effectively implemented.

In the public sector, a high level of localisation has been achieved already and plans are under way to complete the task quickly, at least in certain sectors. For example, all teaching posts are planned to be completely Saudised by the year 2001. It is possible to achieve this goal as only 15 per cent of teachers were foreign by 1998, most of them working in the remote regions where Saudis do not want to work or teaching certain specialised subjects.[55] Along this approach, in 1999 the authorities terminated the services of nearly 16,000 expatriate women teachers who had completed ten years at various schools in the Kingdom.[56] These teachers are to be replaced by Saudi women who have graduated from colleges and universities.

In contrast to the public sector, the private sector, which generates the majority of jobs in the country, only employed about 7 per cent of Saudis in the mid-1990s. Only a very few private branches became well Saudised, notably banks or taxi companies. According to the Fifth Development Plan (1990-1995), the private sector was planned to absorb 95.9 per cent of the new jobs for Saudis but was only able to absorb 16 per cent annually.[57]

Unemployment of many Saudis has remained a serious problem. The Ministry of Planning revealed that only 29.9 per cent of working age nationals had jobs in 1990: 5.3 per cent of women and 54.4 per cent of men.[58] The Economist Intelligence Unit claims that the government admits to some 100,000 unemployed Saudis. Other estimates put the number at one million or 20 per cent of the labour force.[59] The authorities are no longer able simply to create all the necessary new jobs in the public sector and have to find other solutions. The government sector apparently absorbs only 5 per cent annually of the new Saudi entrants in the labour market.[60]

The issue was discussed during one of the sessions of the Majlis al-Shura in 1995 with appropriate resolutions being adopted. The government regulations that followed, stipulated that private companies must increase the number of Saudi employees by 5 per cent each year; otherwise existing work permits for expatriates would not be renewed. This means that private establishments are expected to show 30 per cent Saudisation by the year 2000. Moreover, a list of occupations was announced – such as drivers, receptionists and office assistants – where only nationals can be employed (unless they cannot be found). Fourteen additional work categories were reserved for Saudis in October 1996, including personnel managers, treasurers, auctioneers, custom clearance officers, security guards and all jobs in the insurance sector. Penalties for not meeting the quotas include the disqualification of firms from bidding for governments contracts; not permitting them to hire more expatriates; rejecting renewals of foreign workers' residence permits; and removing firms' eligibility for preferential loans from state-financing bodies. Transport companies serve as good examples of how these policies have been implemented. They can now obtain a licence to operate only if they are 100 per cent Saudised and the Ministry of Communication monitors radio communication with the drivers to establish any irregularities. The Labour Ministry has also introduced regulations that favour Saudis when new job openings become available. Private companies have to announce vacancies in the press, give Saudi job-seekers priority in hiring and get prior approval from the Ministry for any conditions stipulated in the advertisement (for example, that the post requires knowledge of a foreign language - a typical measure used by private companies to secure expatriate hiring as many nationals can not meet this requirement).

Nevertheless, lack of visible progress in the localisation of the country's workforce prompted the Majlis al-Shura regularly to place the issue on its agenda. During its discussions in the years 1997-99, the Council stressed the importance of establishing various incentives for the private sector to hire nationals and provide on-the-job training for them, the necessity to create a national data centre to collect information related to the manpower market and to revise programmes of academic institutions to meet manpower requirements. It also urged the public media to highlight the government's drive to localise jobs in the private sector. At the same time, the authorities began to study other proposals: changes to the social insurance system, aiming at increasing the cost of schemes for foreign workers as compared to nationals, the introduction of fixed-term work contracts for Saudis to prevent them from leaving jobs precipitately and the granting of monthly allowances to graduates until they find jobs. The authorities seem to realise the seriousness of the problem. During the Majlis al-Shura session in February 1997, Prince Naif said that 'Saudisation has become an urgent national issue that requires joint efforts by the government and the private sector'.[61]

In the Kingdom, as in all other GCC countries, serious obstacles to localisation still exist. One is the lack of a work ethic among nationals. According to a study, 'clock-watching' is costing the state budget 1.5 billion rials (US $397 millions) a year: late arrivals lead to wastage of more than 5 million work hours a year, leaving the desk and chatting with colleagues - 19 million work hours, absence without excuse - 30 million work-hours.[62] There is still relatively little acceptance by Saudi nationals of the principle that work can be a duty to society or that manual work is honourable in its own right. Realising the existence of this problem the Interior Minister and Chairman of the Manpower Council, Prince Naif Bin Abdel Aziz, urged young Saudis 'to be ready to do any job, no matter how insignificant and have the competence to take up the challenge of certain jobs'.[63] In turn, a well-known scholar, Khalid Saad Bin Saeed, pointed out that Saudis, as a nation, are not culturally and psychologically prepared for Saudisation.

**Therefore:**

Young Saudis need to be trained and educated regarding the basic principles and ethics of work inculcating in their minds the importance of being a hard worker, love for work and service to others, and commitment to one's job. This means showing the value not only of high positions and high-paying jobs, but more importantly, to make the younger generation appreciate even the blue-collar jobs that have been traditionally done by expatriates. [64]

The low salaries offered in the private sector create another obstacle in the localisation process. To tackle it, a new salary scale was recently proposed. The proposal recommends that nationals in each job category should be paid twice as much as expatriates. Nevertheless, expectations of nationals usually go much higher than this.

Another problem in finding employment for Saudi nationals is the outdated educational system and the lack of a sufficient number of professional schools. In effect, the literacy rate is estimated to be around 70 per cent.[65] Studies by the International Labour Organisation and the World Bank have indicated that Saudi schools have failed to adequately educate students for future jobs.[66] 'Poor teaching methods, coupled with a lack of qualified teachers, remains the major weakness of the system.'[67] Only elementary education in the Kingdom is compulsory and just one-third of students pass from primary to intermediate education. Half then go on to secondary education and half again to university.[68] Attendance in schools is low, especially in the countryside, and the dropout rate is high. It was estimated that during the period of the Sixth Development Plan (1995-2000), 28 per cent of new Saudi entrants in the labour market were dropouts of elementary schools who lacked the basic skills even for entry level jobs.[69] During the previous Plan, about 50 per cent of new labour entrants held qualifications below the primary level.[70] Free university studies, the stipends received and a lack of course distribution requirements pamper students and diminish the efficiency of the system. Moreover, the educational system is biased in favour of more traditional types of education. It was designed to fit the needs of the public sector and has not been preparing students to face the challenges of the private sector. In particular, most students specialise in social studies.

One of the reasons for that situation in the educational system is that the Ministry of Education, at least until 1996, did not receive sufficient funding to keep abreast with the rise of the population. The situation changed, however, in 1997, when the allocation for education went up by 51 per cent. This, for example, enabled the Ministry to plan an increase in the enrolment in technical schools of more than 100 per cent by the year 1999 as compared to 1994, and a 60 per cent increase in vocational schools.[71]

Women's education has been regulated in the Kingdom by a special set of rules. It is not under the jurisdiction of the Ministries of Education and Higher Education as is male education, but under the separate General Presidency for Girls' Education. This institution has a lower prestige than the Ministry and it is also influenced by conservative clerics. This situation has meant that a lower budget has usually been allocated for women's education, the curricula in women's schools have had less emphasis on academic subjects and women have not been given the opportunity to study certain disciplines (such as architecture, engineering or pharmacy). Despite these obstacles, the number of women's educational institutions as well as the number of women students has been steadily growing, their illiteracy rate has substantially declined, and they consistently do better on standardised school tests and achieve higher grades than their male counterparts.[72]

In coming to realise the importance of the proper preparation of nationals to meet the requirements of the market, the government has been developing vocational training. The General Organisation for Technical Education and Vocational Training has been established, and in 1998 it ran some 30 Vocational Training Centres for men aged 18-45 with at least fifth-grade education, eight Pre-vocational Training Centres designed for school drop-outs, over 30 secondary industrial and commercial institutes for intermediate school graduates, and eight Technical Institutes, comparable to two-year colleges.[73] Students of all these schools receive stipends and other allowances, often depending on the results obtained to encourage them to work hard. Graduates with some work experience are obtaining loans to start their own businesses. Up to the year 1998, the GOTEVOT institutions have produced almost 200,000 graduates who are prepared for work in the building industry, agriculture and commerce.

To develop corporate training schemes, regulations were introduced requiring any industrial establishment employing more than 100 people to organise training for at least 5 per cent of its employees every year. Several large companies, such as ARAMCO, Saudi American Bank, Saudia Airlines and SABIC, have been running such programmes for many years. Moreover, Chambers of Commerce and Industry are developing their own training programmes for nationals. 'Career weeks' are also organised to create a forum for major industries, government and school graduates to discuss job opportunities.

The demand for skilled Saudis in virtually all fields has been very high, but there are still relatively few of them whose qualifications can be compared with those of expatriates. Nevertheless, young Saudis are often hired by private establishments just to satisfy corporate quotas to participate in contractual bidding. On the other hand, firms often claim that the government's commitment to Saudisation is not sufficiently reflected when contracts are awarded; they are usually won simply by the lowest bidder which cannot be a company where more expensive nationals are employed in large numbers instead of expatriates. The International Monetary Fund also criticises the government approach, which tries to encourage private sector employers to take nationals simply by making foreign labour more expensive to hire, as this can only damage Saudi competitiveness.[74]

Nonetheless, certain changes for the better have taken place. The younger generation began to accept jobs that traditionally have been rejected by their fathers. For example, Saudi youths have started taking various jobs at hotels and restaurants.

**UAE**

The UAE has the lowest percentage of nationals in the workforce among GCC states, recently around 9 per cent, as a result of a small indigenous population and the scale of its development plans requiring large numbers of foreign manpower. In the Emirates, as in other oil monarchies, most nationals work for the public sector or for semi-state institutions. Nevertheless, even there nationals constitute a relatively small percentage of the workforce, accounting for 41 per cent in the government sector in 1997. For example, 40 per cent of the employees of the general Postal Authority are nationals, while the figure for the Telecommunication Company Etisalat is 24 per cent.[75] In turn, 28 per cent of teachers and staff in the public schools system are nationals.[76] Similarly, at the UAE University in Al Ain nationals constitute only 25 per cent of the faculty.[77] A low number of nationals work in broadcasting and print media. The Minister of Information and Culture, Sheikh Abdullah bin Zayed Al Nahyan, revealed, during the session of the Federal National Council in 1998, that only 50 per cent of people working in the Ministry were nationals, 20 per cent in the Radio and TV Corporation, and an even smaller proportion in the official newspapers.[78] The Minister stated that, within the English-language press, the only nationals on the papers were the owners themselves. Only a few government departments have succeeded in localising most of their staff. The situation is much worse in the private sector, where nationals constitute less than 8 per cent of the workforce. For example, out of 42,000 engineers working in the private companies in 1998, only 120 were nationals, despite the fact that at the same time there were some 2,500 qualified national engineers in the country.[79]

Owing to the UAE's wealth and the rapid expansion of the country's administration and economy, the full employment of nationals did not create any problems for a long period of time. Only in the 1990s, when an increasing number of young UAE citizens began to enter the labour market, did the question of shortage of available jobs surface. The Ministry of Labour and Social Affairs reported in 1997 that 6.3 per cent of national labour force was unemployed.[80] *Jane's Intelligence Review* has estimated that unemployment among nationals has reached a high of 15 per cent, that is, 15,600 people.[81] The problem may worsen in the future as it will be difficult for the government to find the 200,000-300,000 new jobs needed for school graduates in the next decade without jeopardising the efficiency of the workforce by excluding expatriates.

The majority of young nationals would like to work, although most of them are negatively disposed to private sector employment. In the survey conducted among UAE students in 1998, 95 per cent of national women and 92 per cent of men planned to be employed after completing their studies, but 65 per cent of them did not want to work in the private sector because of low salaries, few benefits, long hours and split shifts.[82] Experts also cited other obstacles to the employment of nationals in the UAE's private sector: their lack of adequate knowledge of the English language and not studying subjects at schools connected with the market's needs.

The UAE authorities have started to tackle these issues in a variety of ways. A number of high-ranking bodies have been established through the years, including the Higher Committee for Human Resources Planning, the Higher Committee for Population Strategy and the National Centre for Labour Force Development Planning. Finally, in 1998, the Public Authority for National Development and Employment, chaired by the Minister of Labour and Social Affairs, was also instituted. Its main goal has been to initiate and co-ordinate all actions related to the localisation of the workforce, among them to launch the Labour Market Information System to advise nationals on emerging job opportunities in the private sector. Several proposals have been discussed to increase the employment of nationals in the private sector as the already over-staffed Civil Service is no longer able to absorb all those looking for jobs. For example, in 1999, for every government vacancy there were 150-200 nationals applying.[83] The first decision made applied to the banking sector dominated by Indians and Pakistanis where, in 1997, nationals accounted for only 7 per cent of the total workforce.[84] Starting in 1999, all banks have to raise national employment by 4 per cent a year to reach 40 per cent in a decade. Banks will also be required to implement new salary criteria, defining minimum wages to be offered to nationals, as well as insurance schemes and other services designed for them. In other fields, the right to present cases in the country's courts was already limited to national lawyers and all fishing boats were required to have national captains.

Although the labour law of 1980 granted priority in recruiting manpower in the private sector to nationals, it was never enforced. The current government's policy towards this issue was presented in 1998 by the Minister of Labour and Social Affairs, Matar Humaid Al Tayer. He stated that 'private companies will not be compelled to employ a quota for nationals'.[85] Instead, the Ministry 'will continue suggesting that nationals be employed whenever the company applies for work permits'. 'Employers will have to prove that there is no national who could fill the posts for which they want to recruit an expatriate and „the lack of experience" excuse will not be accepted'. In practice, the Labour Ministry has begun to require private companies to provide detailed data about their employees and conduct field surveys to confirm their labour needs. On the other hand, private companies that employ national job seekers have been granted certain privileges, such as expedited decisions for work permits requested by them.

To help secure jobs for nationals, the government established employment departments in all the emirates. Nevertheless, in the first year of operation, 1997, they succeeded in finding employment for only 105 nationals out of 1,800 recommendations that were made to private companies.[86] The similar Zayed Employment Project, sponsored by the President of the country himself, has been more successful. During the first three years of its operation -1995-98 - the Project has found employment for 8,288 nationals, placing 1,329 of them in the private sector.[87]

The major problem in employing nationals in the private sector is, as elsewhere, the lack of appropriate skills and a suitable work ethic as well as the inadequate salaries offered. Thus, the government plans to establish a special fund for training nationals which will be financed by imposing levies on employers for every non-national they employ in their companies. Such a fund will also help to cover the difference in salaries paid to nationals in the private sector as compared to government establishments (the proposal recommends an extra allowance accounting for one-third of the basic salary). Special allowances will be paid by the Fund to nationals during their training and probationary period. In addition, the Fund plans to offer loans or grants to nationals who want to establish small businesses. Proposals are under discussion to provide all school graduates with stipends until they find employment. The authorities are also considering fixing minimum wages for nationals in the private sector and removing through governmental decisions such obstacles to the localisation of this sector as long working hours and limited benefits. Finally, in 1999, the General Authority for Pensions and Social Security was formed to look after the welfare of nationals; especially those employed in the private sector. Under the new law, nationals employed in federal departments and the private sector would be eligible for similar retirement benefits as well as entitlements in cases of injury, total disability and death. The authorities believe that this scheme will attract more nationals to jobs in the private sector.

The UAE educational system, although relatively good, needs to be further improved to serve well its role in the development of the country. A large part of the national population is still in need of education; 34 per cent of men have no formal education at all and only 6 per cent have some university education.[88] Public schools often do not adhere to international standards. During the session of the Federal National Council in May 1998, most of its members criticised the 'under-capitalisation of the government schools and their inferior facilities, mediocre teaching staff and outdated curricula'.[89] The government is trying to improve this situation, although its efforts are often hampered by the financial constraints of the federal budget. In the 1990s, the UAE had spent annually only about 2 per cent of its GDP on education - much less than, for example, South-East Asian countries or, for that matter, Kuwait (where allocations for education are about 6 per cent).[90] Nevertheless, a separate Ministry of Higher Education and Research was established in 1993 as well as a number of new schools with high standards of teaching and curricula directly related to the country's need. In particular, the Faculty of Medicine and Health Sciences at the UAE University, the Higher Colleges of Technology and Zayed University were opened, with programmes based on reputable Western schools, with English as a medium of teaching and staff from English-speaking countries. Many of these schools began to develop relations with local businesses to understand the needs of the market better and to help find proper employment for their graduates. The Centre of Excellence for Applied Research and Training established in the Abu Dhabi Men's College serves as a good example of the benefits that such co-operation can bring. Several private colleges and universities, which were opened in the 1990s, also improved the situation on the educational market. Most of the new schools are job-orientated, like the Dubai Polytechnic established by the Chamber of Commerce and Industry, Ajman University of Science and Technology, the Etisalat Engineering College in Sharjah and two medical colleges in Dubai and Ajman. Nevertheless, at 13 per cent, the ratio of students registered in natural and applied sciences in higher education is well below those in many developing countries, including some GCC states (in Kuwait about 29 per cent students study these subjects).[91]

Efforts are also being made to upgrade technical education at the secondary school level. The Ministry of Education aims to train nationals to take up to 20 per cent of the technical, service and administrative jobs by the year 2015. New technical schools are planned, some in co-operation with Germany. Moreover, the People's Heritage Revival Association launched a National Occupational Project through which 11 vocational training centres have been established throughout the Emirates. The programmes offered by them help to develop skills that can generate income, keep youth busy during leisure time, provide training for the disabled (which accounts for 10 per cent of society) and for prisoners. Specialised training centres for nationals are also operated by several major companies, such as oil firms, the Emirates Telecommunication Corporation and the Gulf Aircraft Maintenance Company. Chambers of Commerce and Industry organise various types of training programmes as well.

Despite all these efforts, the federal Ministry of Planning expects that localisation of the workforce will be slow, increasing by only some 3 per cent in the next two decades, to reach 12.7 per cent by the year 2015.[92]

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## ENDNOTES

[1] A major problem for any study of this kind is the lack of accurate and verifiable data. Detailed, official demographic statistics for the GCC countries are often not available, either because the relevant figures were never collected or because they were not released by authorities due to political and security concerns. For the discussion of this issue see Andrzej Kapiszewski, *Native Arab Population and Foreign Workers in the Gulf States* (Krakow, Poland, Universitas Press, 1999), pp. 36-37 and 62.

[2] See, for example, *The GCC Demographic Report 1998*, pp. 33-74.

[3] Michael E. Bonine: 'Population growth, the labour market and Gulf security', in David E. Long and

Christian Koch (eds.), *Gulf Security in the Twenty-first Century* (Abu Dhabi, The Emirates Centre for Strategic Studies and Research, 1997), p. 255.

[4] Ibid., pp. 257-60.

[5] As in other instances, due to the lack of reliable data, some figures in this table are estimates only.

In particular, figures for Saudi Arabia are debatable.

[6] Kapiszewski: *Native Arab Population*, pp. 90-95

[7] Bonine: 'Population growth', pp. 257-60.

[8] Quoted from Sharon Stanton Russell, 'Migration and political integration in the Arab world', in

Giacomo Luciani (ed.), *The Arab State* (Berkeley, University of California Press, 1990), p. 388.

[9] *Akhbar Al Khaleej*, 6 June, 1997.

[10] Kapiszewski: *Native Arab Population*, pp. 50-52.

[11] Ibid., pp. 94-95.

[12] KUNA, Oct. 20, 1998.

[13] *Selected Social Trends in the ESCWA Region* (New York, United Nations, 1997), p. 95.

[14] The Economist Intelligence Unit (thereafter EIU) *Bahrain. Country Profile 1996-97*, pp. 10-11; EUI, *Kuwait. Country Report* (2nd quarter 1997), pp.

18-19; Oman - Ministry of Development, *Statistical Yearbook 1997*, Table 2.4, p. 81; Qatar - *Annual Statistical Abstracts 1993*, p. 64; EIU *Saudi Arabia 1997*, p. 65; United Arab Emirates - *Al Ittihad*, 4 Dec., 1997.

[15] Kapiszewski: *Native Arab Population*, p. 101.

[16] As reported in *Gulf News*, 26 Feb. 1997.

[17] *Gulf News*, 12 Dec. 1997.

[18] *Emirates News*, 16 June 1997.

[19] UNESCO, *World Education Report* (Paris, 1998).

[20] *Selected Social Trends in the ESCWA Region*, p. 83.

[21] *Khaleej Times*, 22 Feb. 1998.

[22] Quoted in Hamoud Salhi, 'Fixing the education system to meet needs', *Gulf News*, 6 June 1998.

[23] The only exceptions have been some private schools, often run by Westerners, who operate under international standards.

[24] Munira A. Fakhro, 'The impact of education and vocational training on female employment in the Gulf states', paper presented at the University of Exeter conference on 'Human Development in the Arab Gulf' (July 1998), p. 2.

[25] Ministry of Labour and Social Affairs, *Arab News*, 5 Oct. 1997.

[26] Erik R. Peterson: *The Gulf Co-operation Council: Search for Unity in a Dynamic Region* (Boulder, Colorado, Westview Press, 1988), p. 172.

[27] *Emirates News*, Dec. 10, 1998.

[28] The Emirates News Agency WAM, 28 April. 1999.

**ENDNOTES (appendix)**

[29] *Bahrain Analysis*, Oct. 1996, p. 7.

[30] Anthony H. Cordesman, *Bahrain, Oman, Qatar, and the UAE. Challenges of Security* (Boulder, Colorado, Westview Press, 1997), p.79. The government's figures are much lower: 2.4 per cent of the total workforce and 6 per cent among nationals. EIU *Bahrain. Country Report* (2nd quarter 1999), p. 15.

[31] *Khaleej Times*, 30 Sept. 1997.

[32] *Khaleej Times*, 11 June 1998.

[33] *Khaleej Times*, 2 Feb. 1998.

[34] *Gulf Report*, July 1997, p. 3.

[35] For example, Planning Minister Ali al-Moussa stated in June 1999 that unemployment among Kuwaitis was around 1.2 per cent. Reuters News Agency, 30 June, 1999.

[36] EIU *Kuwait. Country Report* (1st quarter 1997), p. 18.

[37] *The Washington Report on Middle East Affairs*, (March) 1999, p. 74.

[38] EIU *Oman. Country Profile 1997-98*, 1997, Table 9, p. 45.

[39] *Gulf News*, 4 June1999.

[40] Royal Decree No.1/96, *Official Gazette*, Jan. 1996.

[41] *Gulf News*, 5 May 1998.

[42] *Gulf News*, 5 May 1998.

[43] EIU, *Oman. Country Report* (4th quarter 1998), p. 13.

[44] Reuters, 25 June, 1999.

[45] Asya Mohamed Suleiman Al-Lamky, *Higher Education in Oman: Perceptions of University Graduates in the Context of Dependent Development, 1970-1990* (PhD thesis, The George Washington University, 1992), p. 216.

[46] Fawzia Al-Farsi: 'Omanisation and faculty development in Sultan Qaboos University', in K. E. Shaw (ed.), *Higher Education in the Gulf. Problems and Prospects* (Exeter, University Press, 1997), p. 190.

[47] *Emirates News*, 10 Oct. 1997.

[48] EIU *Oman. Country Report* (1st quarter 1998).

[49] *Khaleej Times*, 23 March 1998.

[50] See Brian Scudder, 'Qatarisation: a slow march', *Gulf Business*, Nov. 1996, p. 45.

[51] As quoted by Anders Jerichow, *The Saudi File. People, Power, Politics* (Richmond, Curzon Press, 1998).

[52] Gene Lindsey, *Saudi Arabia* (New York, Hippocrane Books, 1991), p. 237.

[53] Ismail A. Sirageldin, Naiem A. Sherbiny and M. Ismail Serageldin, *Saudis in Transition. The Challenges of a Changing Labour Market* (Oxford, University Press, 1984), pp. 58-9.

[54] *Arab News*, 4 May 1998.

[55] Mona Al Munajjed, *Women in Saudi Arabia Today* (London, Macmillan Press, 1997), p. 88.

[56] *Arab News*, 15 June, 1999.

[57] Abdulrahman Suliman Alturaigi: *Towards Strategic Planning for Indigenising Workforce in the Saudi Arabian Private Sector* (PhD thesis, University of Missouri-Rolla, 1997), p. 93.

[58] *Fifth Five-Year Plan*, Riyadh, 1990, quoted after Peter W. Wilson and Douglas F. Graham, *Saudi Arabia. The Coming Storm* (New York, M.E. Sharpe Books, 1994), p. 255.

[59] EIU *Saudi Arabia. Country Report* (2nd quarter 1997) and the Gulf Centre for Strategic Studies report, *Al Qabas*, 3 Oct. 1997. In turn, *Alam Al Iqtisad* (July 1998) predicted that until the year 2000, unemployment of nationals will remain on the same level as in 1995, that is 13.2 per cent (p. 22). Reuters on 24 June 1999, quoted a Saudi University professor who put the unemployment in the Kingdom at 27 per cent.

[60] H. A. Al- Towajri, *The Labour Market in Saudi Arabia: Family Effects, Compensating Wage Differentials, and Selective Bias* (PhD D thesis, University of Oregon, 1992), p. 9.

[61] *Saudi Arabia 1997*, Business Monitor International, p. 63.

[62] *Arab News*, 27 Dec. 1997.

[63] *Arab News*, 18 May 1998.

[64] Khalid Saad Bin Saeed, 'Saudisation: preparing the people', *Arab News*, 13 Feb. 1998.

[65] Alturaigi: *Towards Strategic Planning*, p. 79.

[66] Anthony H. Cordesman: *Saudi Arabia. Guarding the Desert Kingdom* (Boulder, Colorado, Westview Press, 1997), p. 72.

[67] Alturaigi: *Towards Strategic Planning*, p. 85.

[68] Saudi Development and Training Co. Quoted after Mai Yamani, 'The new generation in the GCC: the case of Saudi Arabia', in Rosemary Hollis (ed.), *Oil and Regional Developments in the Gulf* (The Royal Institute of International Affairs, London, 1998), p.145.

[69] Alturaigi: *Towards Strategic Planning*, p. 80.

[70] Ibid.

[71] EIU *Saudi Arabia. Country Profile 1995-96*, pp. 23-4.

[72] Wilson and Graham: *Saudi Arabia*, pp. 240-4.

[73] *Arab News*, 21 Feb. 1998.

[74] EIU *Saudi Arabia. Country Report* (2nd quarter 1997), p. 16.

[75] EIU *United Arab Emirates. Country Report* (2nd quarter 1998), p. 17.

[76] *Al Khaleej*, 4 Jan. 1998.

[77] *Emirates News*, 3 June 1998.

[78] *Khaleej Times*, 25 March 1998.

[79] *Gulf News*, 11 May 1998.

[80] *Emirates News*, 10 March 1998.

[81] *Jane's Intelligence Review*, June 1996, p. 5.

[82] Graddon Rowlands, *Attitudes of Nationals to the Private Sector* (Abu Dhabi Women's College, 1997).

[83] *Khaleej Times*, 20 April, 1999.

[84] *Gulf Today*, 15 May 1998.

[85] *Gulf News*, 14 Oct. 1997.

[86] *Gulf Today*, 11 Jan. 1998.

[87] *Emirates News*, 25 Aug. 1997.

[88] The National Bank of Dubai, *Economic Report* (June 1999), p. 3.

[89] *Emirates News*, 25 Feb. 1998.

[90] The National Bank of Dubai, *Economic Report* (Sept. 1998).

[91] Ibid.

[92] *Emirates News*, 4 April 1990.

TEND 2000

## Crossroads of the New Millennium

# Culture At The Crossroads: The Education Of Women. Is There A Future For Women's Colleges In The New Millennium?

Prepared and Presented

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Seminar

# Abstract

"In all societies, there is a new interest in the education of women, their role in society, and their place in the economy. Western societies have moved away from single-sex education in the past few decades, but recent research and experience has begun to highlight again the value of single-sex colleges and schools.

Changes in working patterns, and in the structure of a modern economy, have created a demand for a fully-educated workforce of men and women capable of contributing to a knowledge-based economy. The enhanced status of women in work and the professions has exacted a high price in terms of the stress on individual women and families. New ways must be found to educate women in ways which help them to make a full contribution in the economy, without losing their traditional feminine strengths.

Single-sex women's colleges have a particularly strong contribution to make, recognising the distinct pattern of women's lives, and offering role-models of success to give confidence and self-esteem to women. Women and girls perform better in key subjects like science, maths and technology when they are studied alongside other women. Men and boys also should have a choice of single-sex education if they so wish."

## Culture at the Crossroads: The Education of Women.

## Is There a Future for Women's Colleges in the New Millennium?

It is a very great pleasure to be leading a seminar at this important conference, Tend 2000. It is particularly good to celebrate the achievements of the Colleges of Higher Technology in the United Arab Emirates. For the purposes of our discussion today, I would like to pay particular tribute to the achievements of the staff and students at the women's higher college of technology, which I had the great pleasure of visiting in 1997 at the previous Tend conference, and I look forward very much to my college visit to the Abu Dhabi Women's College this afternoon.

I have been very privileged in my career to visit many countries around the world, and in recent years particularly have travelled throughout the Gulf, and in South East Asia, the Indian subcontinent and in Latin America. It is no exaggeration to say that in each of the countries which I have visited, the education of women has become a major concern of governments and community leaders. Time and again I have been told by decision makers around the world "The future of our country lies with the education of our women."

Why has this become such a major issue for so many countries? I would suggest that there are three principal reasons. Fhirstly, we in the West have had a major revolution in the past generation. The rise of feminism, changes in the way in which families are organised, and the growth of technology, "labour saving gadgets", have revolutionised women's lives. It is difficult to know which is cause and which is effect, but certainly alongside these major changes in women's lives there has been a great growth in women's education, and in very recent times, participation by women in higher education has doubled or quadrupled in many western countries. My generation would however be the first to concede that the changes in women's roles, beneficial in many ways though they have been, have also exacted a very high price in terms of pressure on the family, and pressure on women themselves. I will return to this argument later, but undoubtedly the countries of the Middle East and the Far East, where this revolution has not yet taken hold in the way it has in the West, watch with both apprehension and envy, and are determined – absolutely rightly – to learn from our mistakes. I hope this is one of the things we can discuss today, and I shall return to it in a few minutes.

The second and perhaps dominant reason why countries outside the West have begun to focus on the importance of women's education is undoubtedly the change in global economies. Changes in technology mean that the economies of the future will not include the huge manufacturing labour intensive and muscle intensive industries of the nineteenth and early twentieth centuries. The industries of the twenty-first century are industries of information technology, e-commerce, and the service industries such as leisure, tourism and the arts and entertainment. These industries require a very different set of skills and human strengths from those of the old manufacturing industries, and these are skills where women are at least the equals of men.

These new industries are also knowledge based and so entail a rethink of educational provision. In such economic change, education and high standards of education for the entire population become in much greater demand than the muscle power of the old heavy manufacturing industries. No country can afford now to have an under-educated population, whether this population consists of women or of poorer classes. Unskilled and semi-skilled jobs for the uneducated are gradually disappearing, and the demand for an ever increasing workforce with high knowledge based skills, resting on an effective universal education system is all consuming.

In this climate, no country which hopes to compete in the global economy of the twenty-first century, can afford to under-educate its women. But of course, highly educated women, finding themselves in demand in the workplace, also demand very different social and familiar structures from those that still exist in many countries today, and which existed in my own country until perhaps the 1960's.

This emerging self-consciousness of women, and the implications it has for the structure of families and society, is the third reason why so many countries are now putting the issue of women and their education at the top of their policy agenda.

I said earlier that we in the West would be the first to concede that we have paid a high price for women's participation in the marketplace of our economies. That doesn't for one moment mean that I believe it is wrong that women have moved out from the confines of family into that workplace and marketplace of decision making: I would only argue that perhaps we moved into the feminist revolution, with all that it implies for work and life patterns, with inadequate recognition of the problems that would follow in its train, and inadequate time spent thinking how such problems could be tackled.

Daily we read in our newspapers reports of surveys showing the huge stresses and strains of the dual income family, where both parents work long hours away from the home, and arrive home too tired at the end of a working day to give proper time and attention either to each other or to their children. In the United Kingdom we have the highest rate of working mothers in Europe and North America, and within that the highest rate of working mother whose children are still under the age of seven. All of this in businesses which expect high flying employees to be globally orientated, ready to pack their bags and travel thousands of miles at twenty-four hours notice, and often arrive back off on an early morning plane to start a day's work without five minutes at home in the meantime. Such demands do not sit easily with the family bonding which needs quiet and quality time together.

Inevitably then the education of women, and the nature of that education, becomes a central concern for us all. And I hope that today we can some useful discussion about the most appropriate form of education which can be offered to women, to try to ensure that they are able to take their full place in the community, to contribute all their gifts and skills to the economy, while at the same time maintaining the structure of family and society which each of us in our national contexts holds so dear.

The provision of elementary education for all, both boys and girls, is now generally accepted. It is the post sixteen education of women which remains an issue. For the past half-century in Western Europe and North America, we have been abandoning our early systems of separate education for young men and young women, in favour of mixed schools and colleges. Throughout the 60's, 70's and 80's, it became the accepted wisdom of politicians and educationalists that the social benefits of mixed schools were so great, that we should hasten to amalgamate all the separate provision into larger mixed units at both secondary and tertiary levels. In Oxford only one women's college remains, and no single men's college. In Cambridge, I am happy to say that we still have three remaining women's colleges, but no remaining men's college. In America, several of the great "seven sisters", pioneers of excellence in women's education, have now become mixed colleges. The colleges of teacher education, almost all single sex in their early origins, have now all become mixed, many great names of women's education having disappeared in the process, and the women's colleges of London University are now merged into larger mixed units.

In the last four or five years however, this received wisdom has begun to be questioned. In the United Kingdom, the issue has been accentuated by the annual "league tables" of performance of educational institutions. In these league tables, the girl's schools and colleges have been publicly seen to be amongst the highest achievers in the country. Last year for example, out of the thousands of schools listed in the league tables, nine of the top ten were girls only schools, and the tenth was a boys only school. Single sex education has suddenly become a very desirable choice. Parents are lining up to try to get their daughters into these successful girls schools, and I am predicting that in the next decade or two we shall be reinventing single sex colleges and schools all over again.

I of course have a special interest in single sex colleges, as my own college is one of the three women's colleges in the University of Cambridge, and one of only two where the lecturers and Fellows, as well as the students, are all women. My college is unique in Oxford and Cambridge, in that it only accepts only women over twenty-one as undergraduates, and some of our graduates are even in their forties and fifties. As head of such a college in one of Britain's world class universities, I am very conscious in my daily work of how much single sex education has to offer to women who come to us from around the world.

Much research in recent years has demonstrated that women and girls do perform more confidently when they work in single sex environments, and that this enables them to be successful in subjects which can all too easily be considered male territory. Girls in single sex schools and colleges shine in science, mathematics, information technology and design technology, while in mixed schools it is the boys who perform well in such subjects and girls are pushed aside. A few years ago, Her Majesty's Inspectors in the United Kingdom described their observations of computer classes in secondary schools, and found that the girls were often pushed out of the way – sometimes physically so – by the boys in the groups gathered around the computers to work.

If women are to take their place in the economy of the future, then the subjects allied to technology like science, mathematics and IT, must be a full part of their experience. These subjects are the subjects of the future. We are a technology-based, knowledge-based world economy, and the gateway to employment and career success lies in the technology and science fields. In single sex schools and colleges, girls and women are able to develop their talents without gender biasis against their success.

But in single sex colleges we are also able to offer a much richer experience in the social aspects of life for women. After decades of trying to eliminate gender differences, and indeed arguments from feminists that no such differences exist, I have become increasingly aware that the life patterns of women are inherently different from those of men. There are very few psychologists or educationalists who would now disagree. Women's minds work differently from men's. Women mature earlier, and their concerns and preoccupations are very different from those of their male contempories throughout much of their early lives. Many women do choose to study at a slightly later stage in their lives, after they have settled into family life and their children are becoming more independent. Therefore the opportunity to study in an all women's college, where they spend at least part of their work and study time with other women whose interests, concerns and maturity matches their own, is a great help to them and a spur to their success in work and life.

My college is part of the University of Cambridge, and we think that we offer women the best of both worlds. They live and are taught in the all female atmosphere of the college, and form lifelong friendships with their female contempories. Nevertheless, for their lectures and some of their social activities, they are out in the mixed university, working alongside the brilliant young men with whom Cambridge is blessed, and they enjoy the intellectual and academic stimulus which this provides. They experience the great names who in Cambridge lecture even to the first year undergraduates; unlike many of the great universities in other countries, undergraduates of Cambridge have access to our Nobel prize winners and others of that caliber. At our Guest Nights and formal occasions our women students can bring male members of their families or male colleagues from the University as guests in college.

But there is a further benefit, to which I personally attach very great importance. Many young women still suffer from a feeling that they are not able to achieve at high levels, or to reach the top in an increasingly competitive and still male-dominated world. The opportunity of seeing around them role models of high achieving women who have made it through what we call the "glass ceiling", to senior academic positions, and those who have achieved success in the outside world, can be an enormously empowering experience for young women in their developing years. Women's colleges offer such role models, and become a focus both within the university and in their nation for such high achieving women. The importance of these examples in giving confidence and motivation to young women cannot be over estimated. By their very nature, women's colleges convey an important message to the students in their care, that they too can succeed in the world. All too often in mixed colleges, the staff is predominantly male, and the assumption can be made implicitly that to succeed and become an important and senior person, one must be a man! These perceptions dominated our societies for so many generations, and ensured that the self-image and self-esteem of young women was curbed as soon as it was born. We try, and I think succeed, in women's colleges, to say to the young women who are our students "Grow as tall as you wish, there are no limits to what you can achieve, if you believe in yourself".

I do want to emphasis that I am not arguing only for single sex education for women. I believe that there are many boys and young men who benefit from the all male atmosphere of men's colleges and men's schools. It is interesting to note that in the United Kingdom we have already become concerned that the boys in our secondary schools are now under-achieving in linguists skills, and particularly modern languages, where girls excel. The assumption that being good at languages is somehow a female thing and beneath the attention of a red-blooded male, is providing dangerous incentives to young men to turn away from language skills. These are such an important component of the modern global society, that they too are being seriously handicapped. There are also many young men who are extremely shy in female company, but who flourish and feel confident in the company of others of their own gender. So let me make it clear that while I believe the greatest issue facing us is single-sex education for women, I would not want to deny the opportunity to young men to have a similar choice of single-sex education with their peers if they so choose.

We are now embarked on a new millennium. Rightly we are questioning many of the assumptions of the past, and looking ahead to a world which changes at such a rapid pace that no firm predictions of the future can be made with confidence. Nevertheless, those of us who work in the field of education know that the best we can do is to provide young people with the best basis of knowledge and skill that it is in our power to give. We know also that we have a duty to give them a confidence and self-esteem that will carry them through the experiences of future lives whose nature we can only dimly guess. As they launch forward into an unknown world, it is all the more important that we ensure that women are fully equipped to take their place in the century that some have called the Century of Women. I hope for my part that it will be a century of genuine and equal partnership between men and women. Each has special skills, talents, perceptions and strengths to bring to the global community, and it is our responsibility to ensure that society has at its disposal the best educated women and men to ensure national and global success in economic and private life.

It is an awesome responsibility, but I believe that the young women of today are more than ready to take their place in the global market-place, while cherishing all that is best in their feminine nature. We owe it to them to ensure that they have an education that enables them to do so with confidence and pride.

TEND 2000

## Crossroads of the New Millennium

# Universal Education: A Goal For The 21st Century

Prepared and Presented

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Workshop 1

# Abstract

As the world enters the 21st century, a natural question for the state, in dealing with the education sector, is what its long-term goals should be. Our premise is that the most important worldwide goal of the 21st century should be universal education. By this we mean that, by the year 2099, every child, no matter how poor, in every country of the entire world, should have access to free (state-sponsored) education for twelve years. The great distance, which the world will have to travel in order to achieve this goal, is the reason why we have chosen to estimate a hundred years for the completion of the journey. Let us also not underestimate how many nations of the world will have to become involved in this. Lack of education is a worldwide problem.

In committing themselves to this hundred-year goal, each individual nation should keep in mind five important facts.

The first of these is that, within one nation having sufficient means, the goal can be achieved. We know this because there are certain nations in the world today in which the goal has been achieved.

The second is that the achievement of the goal, in those nations which have achieved it, is a direct cause of the wealth of those nations. Many nations today are temporarily wealthy because of certain natural resources which they possess. Prudent nations are already taking steps to diversify their economies. The true source of permanent wealth for a nation, however, is an educated populace.

The third is that the wealth of those wealthy nations is in turn a direct cause of the prosperity of the more important of their citizens. This may seem a paradox in view of the immense sums that those nations spend on education. It is, however, true, as the citizens of those nations will attest.

The fourth is that all the peoples of the world can take pride in the contributions to worldwide learning which have been made by their ancestors. Nothing is so destructive to the goal as the false belief that certain peoples are incapable of learning at higher levels. The Great Pyramids and the development of algebra in Persia should be remembered and celebrated.

The fifth is that direction of the effort to achieve educational goals in a nation from outside that nation, by other nations, has been shown down through history to be futile. No matter how well-meaning the other nations might be, imposition from outside tends to be carried out by people who take too much pride in the achievements of their own nation. Such a goal must arise within the countries that wish to achieve it, through the efforts of their own citizens.

# Universal Education: a Goal for the 21st Century

## EDUCATION INITIATIVES AND POLITICAL STRUCTURES

Before the main thrust of this paper can be fully appreciated, it is necessary to consider and understand that great education initiatives may be made within a wide variety of political structures. For example:

- Within a monarchy, such as that of England, the great universities of Oxford and Cambridge were established. Let us remember that during the first several hundred years of the existence of Oxford University and Cambridge University, the kings of England were true ruling kings, unlike the situation today.
- Within an aristocratic form of government, such as that of ancient Athens, the Socratic Academy was established, and flourished for a thousand years. Here let us remember that Athenian democracy was not continuous, and Athens alternated between periods of democratic rule and periods of aristocratic rule.
- Within a religious government, such as that of the Pope in Rome, the great Catholic universities of the world were established, and still continue today.
- Within a communist government, the great Moscow technical schools were established, bringing educational opportunities to far more people than ever before, in Russia and throughout the former Soviet Union.
- Within a democracy such as that of the United States, twelve years of free education for all citizens was established, together with the systems of state universities and community colleges throughout the fifty states.
- It is also necessary to consider and understand that education in a country usually includes education about the political system of that country. For example:

  Within the democracy of the United States, there is a required secondary school course, today usually called "government," although, when this author took the course, it was called "civics." This course explains the American democratic system of government, which is not easy for a child to understand; and this is why it was presented in the last year of secondary school.
- Within a communist government, the students learn Marxism. Our own university in the United States has many graduate students who come from the People's Republic of China, and on the transcripts of their undergraduate work in China we see references to courses they took on the subject of the building of socialism.

- Within a religious government, schools are established which teach religion, among other subjects. This is true not only in the seminaries, where priests are taught, but even in the elementary schools, where children as young as five will be taught stories from the Bible.
- Within the courses taught at the Socratic Academy, there were discussions of the best form of government, and these discussions were within the context of the governments existing in Athens at the time.

## THE DELORS REPORT

We have seen that educational initiatives are possible in any political structure, and that education is usually, in part, about political structure. Keeping these two facts in mind, let us pass to the present era, and ask ourselves what steps have already been taken, in the direction of the goal of universal education. The primary step of this kind is embodied in a report made in 1996 entitled "Learning: The Treasure Within" [1]. This is the report to UNESCO of the International Commission on Education for the Twenty-First Century, which was headed by Jacques Delors. In what follows, we refer to it as the Delors Report.

This International Commission was made up of distinguished members from all areas of the world. It included one member each from China, Japan, Korea, and India; the United States, Mexico, the Caribbean, and South America; two (including the Chairman) from Western Europe, two from Eastern Europe, two from Africa, and one from the Arab world. It is clear, therefore, that all areas of the world were represented.

The highlights of the Delors Report, including the complete text of all its recommendations, are available on the Web [2]. After the report was issued, a Web discussion group was set up at delors-forum@unesco.org "to encourage debate and reflection on the main ideas expressed in [the Delors Report]." Anyone with Web access may subscribe to this by sending a message to majordomo@unesco.org and typing Subscribe delors-forum in the body of the message.

One important consequence of the Delors Report was the Conference on Education for the Twenty-First Century in the Asia-Pacific Region, held in Melbourne, Australia two years later, in 1998. This was presented by the Australian National Commission for UNESCO in association with the Australian National University Centre for UNESCO.

This 1998 conference was based directly on the framework established by the Delors Report. It still maintains a web site [3] containing links to the five major keynote addresses, to the final summation of the conference, and to an extensive and well thought-out paper on post-conference implementation strategies and initiatives.

The Melbourne Conference, unfortunately, stands in stark contrast to the lack of significant interest in the Delors Report in other parts of the world where most of its recommendations, in our opinion, are needed: South America, the Arab world, Africa, India, and China. The Calendar page of the Delors Report web site [4] lists nothing from any of those regions except for an International Symposium on Curriculum Reform Towards the 21st Century, held in Zhuhai, China, in November and December 1998 [5]. We will now speculate on the causes of this state of affairs and point toward what we feel are meaningful solutions.

## PROMOTION OF EDUCATION AND OF DEMOCRACY

The United Nations has many agenda items throughout the world. Among these are the promotion of education and the promotion of democracy. Our thesis here is that these two agenda items are becoming unnecessarily commingled with each other.

We say unnecessarily because the promotion of education does not depend on the simultaneous existence of democracy. As we have seen earlier, education may be vastly improved, and has been vastly improved at many previous times in history, within the context of a democracy, a monarchy, an aristocracy, a religious government, or a communist government.

For the specific purposes of improving education within a country, democracy is not necessary. As we have seen, this is fact and not opinion, no matter how frustrating it might be to those who love democracy. In that group, I include myself. I am from the United States; I am from a democratic country; I love democracy. I also love education, and I believe that education is the solution to many of the problems of the world, including the problems of those countries, which have political systems other than democracy.

The unnecessary promotion of democracy by the Delors Report is the principal barrier to its being taken seriously by the countries, which need it most. Jacques Delors was the President of the European Commission from 1985 to 1995. He is a giant figure on the world political scene and UNESCO was greatly honored to have him give his time and his name to the report. His sincere wish to speak to the entire world, rather than only to the industrialised West, is manifest in the diversity of members of the Commission.

Yet, in our opinion, he did not go far enough. Knowing that education almost always includes education about one's form of government, and knowing that the United Nations promotes democracy wherever it can, he seemingly could not resist the temptation to include, among his recommendations, certain recommendations concerning democracy.

In doing so, he seemingly alienated much of the world. Only in the Asia-Pacific Region was there a serious follow-up to the Delors Report, in the form of a regional conference; and even here, the conference was held in Australia, which is part of the Region only geographically. It belongs in spirit to the same grouping of countries as the United States and Canada. Although there are many democracies in the region, China, which needs the Delors Report more than most, is not a democracy.

This leads to the second part of our thesis, which is that the Delors Report is much more valuable and useful than many countries have been giving it credit for. We urge everyone here to obtain their own copies from UNESCO Publishing and to use it in their plans. In what follows, we will draw extensively on ideas which it introduced.

## EDUCATIONAL STATISTICS

In order to start addressing the problem of universal education it is first necessary to determine the scope of the problem. We have to know, for each country, how many of its citizens are educated, how many have had three years of school, how many have had six, and so on. We need, in short, a good collection of educational statistics on a worldwide basis. In this we are hindered by the fact that most collections of educational statistics are done only within the usual groupings of countries.

In my own country, for example, there is a National Centre for Educational Statistics. The purpose of this Centre is to collect comparative data on education for several countries, so that we in the United States can tell if we are lagging behind other countries in certain important indicators. Despite our image as a great educational model, this sometimes does happen. For example, the last time that records were collected, we were devoting 12.9% of all our government spending to educational spending. This is not the highest; for example, Hungary was devoting 17.4%, and Canada, Norway, and Switzerland were all devoting more, as a percentage of total government spending, than we were.

The problem with the data collection made by the Centre is that it is only for the United States, Canada, Australia, New Zealand, Japan, Western Europe, and some of Eastern Europe. This is fine for our purposes, but it leaves the other countries of the world without basic knowledge that they need for the purposes of justifying their own further educational initiatives. In particular, countries can easily ignore comparisons with other countries much richer than they are, but it is harder to ignore comparisons with other countries which share their geography, religious majority, and economic situation.

I hope that the Latin American countries, the Islamic countries, the African countries, and the Asian countries have formed, or will form, centres for educational statistics. Each country should be able to see how well it is doing by comparison to others in its group. In forming policy for such centres, and determining what data should be collected, our Centre is indeed a good model. I urge everyone concerned with this issue to study our Centre's Web site, particularly the page [6] which contains links to the 45 indicators which the Centre uses. These fall into six categories:

- participation and student flows;
- achievement and attainment;
- education and labour market destinations;
- education institutions;
- contextual factors;
- societal support for education.

Among the data to be collected, there should be included not only absolute numbers, but the amount of progress each country has made since the last time that data was collected.

## MAKING THE INITIAL DECISION

The Delors report ([1], Chapter 9) recommends that "a quarter of development aid [received by a country] should be devoted to the funding of education." In justifying the initial decision made by a specific country to spend far more on education than that country has in the past, we need to look at the issue of responsibility that comes with development aid.

Many countries are receiving development aid these days. Computers are coming in; airports are being expanded; new airports are being built, particularly at a distance from the capital; new highways are being constructed. It is too easy for people to use the new computers, airports, and highways without thinking about the responsibility that goes with it. Twenty-one years from now, when newly born citizens become adults, some of those adults will have to know how to maintain the computers, airports, and highways. Otherwise there is a continuing dependence on other parts of the world, which is destructive to a necessary sense of national pride.

It is necessary not only that governments fund education at higher levels than before, but that these higher levels are made a permanent part of the government budget. Contributions from industry to the school budget should not be relied on for essentials, although they should be strongly encouraged. I remember vividly my first school visit to a factory which made bicycles. I had never seen the inside of a factory before, and that factory visit gave me a much better understanding of how the world works.

The new educational initiatives should always be viewed as a supplement to existing education, rather than as a replacement for it. We must never repeat the mistakes of the colonial doctors who, in their efforts to bring European medicine to Africa, sought at the same time to suppress African medicine. In many parts of Africa, there are plants which do not grow in Europe, and some of these plants have medicinal properties which were therefore unknown to European doctors. This knowledge was disparaged by the colonial masters, and those who possessed the knowledge were referred to as "witch doctors," a humiliating and unnecessary insult that must never be repeated.

Who should decide what the schools should teach -- the curriculum, in other words? Should it be teachers, local administrators, or national administrators? Here Europe and the United States are themselves divided, and there is no consensus. The United States has always left this up to local administrators with strong input from teachers and parents. Europe has not always done this, and France, in particular, has had a tradition of curriculum control at the national level.

There are advantages to both systems. Under the French system, a family can always move from one city to another with the knowledge that their children will be studying exactly the same subjects in the same year, in their new school as in their old school. The curriculum is exactly the same at the two schools, because it is determined nationally. Under the American system, it has been easier for teachers to introduce computer courses before national opinion was ready for this. My wife was teaching secondary school mathematics thirty years ago, and one of her students had learned the Fortran programming language. She proposed a Fortran course and taught it for several years, a long time before such courses were common in other schools. It is fair to say that both systems have their uses and neither one should be totally disparaged.

Great care should be taken in choosing those who will oversee the specifics of school budgets. I have seen too many times what happens when the control of this falls into the hands of mean-spirited people.

Especially to be avoided is the belief that certain people should not be educated. Who such people are varies from one country to another. They are untouchables in some, although not all, parts of India; women in some, although not all, parts of the Islamic world; and they have, historically, been dark-skinned people in some, although not all, parts of the United States. In over half the world, however, they are poor people, who cannot afford education.

Let us always remember that one of the great strengths of the United States is that education is free. No one has to pay to go to school, anywhere in the United States, and the result is that the entire citizenry is educated and can contribute to the strength of our economy. It is a custom that must, and will, I believe, be worldwide by the end of the twenty-first century.

Many educated people are uncomfortable with the idea that the uneducated should become educated. This is natural and should not be made too much of. People are uncomfortable with many things they must do. People who insist too strongly that they will not do things they are uncomfortable with must be told, gently but firmly, that they must do them. Otherwise, there is built up an enmity toward education in the society, with an accompanying potential for revolution, but also for insufficient effects of education on the whole society.

## PRESCHOOLS

When I was growing up, preschools were called "nursery schools." By either name, they are schools for those too young to attend kindergarten. Preschools are often misunderstood, and associated with mothers in the United States who have jobs and must leave their children somewhere. That also exists in the United States, but it is called daycare, not preschool. When my grandson was two years old, he was in preschool for just three hours, two days a week. Now he is four years old, and he attends for just four hours, three days a week.

The importance of preschool should not be minimised. My sister is a university teacher, and she was once a consultant in Togo, where preschool availability was, at the time, being greatly expanded. Talking with her, I was wondering why Togo was considering preschool expansion more important than secondary school expansion, which was also greatly needed. Many years later, after observing my grandchildren's mental development, I can see Togo's point. Children become more intelligent throughout their whole lives if they receive the mental stimulation of preschool when they are very small.

In each of my grandchildren's preschool classes, there are two teachers. This is a technique that also works well, sometimes, at higher school levels, and must not be made impossible by administrative rulings. Also, each parent is encouraged to participate, even if only in a very small way, such as bringing paper plates or crayons. This fosters an involvement of the parents with the schools that should continue and be encouraged all through elementary and secondary school.

## PRIMARY EDUCATION

The most important educational initiative for today, for the year 2000, is in primary education. Everyone in a society should learn reading, writing, and arithmetic. For years the joke in the United States has been that small children, who do not know how to spell yet, will refer to reading, writing, and arithmetic as Readin, Ritin, and Rithmetic -- the Three R's. Sometimes the joke is augmented by what we call the Fourth R, for Responsibility.

One of the side benefits of universal primary education is the opportunity to teach all children personal responsibility. If they steal or fight, they will be immediately punished. In too many societies, the poor are perceived as being thieves and brawlers; indeed, this is one argument that occasionally arises against educating them: they will merely become educated thieves and brawlers! Educating them in fact does the opposite, if the teachers combine the three R's with the fourth R.

Punishment, on the other hand, must not itself involve violence. The children are being taught not to use violence against each other, and the teachers must not use violence against the children, either. After my mother retired from teaching, she started a movement in opposition to the common practice of hitting children for their misdeeds. This practice has now been banned in England and in most of the United States. Small children today are placed in "time out," which means that they must sit apart from the others until they agree not to behave badly.

## THE MIDDLE SCHOOLS

In the United States, middle schools, also called junior high schools, are for grades 6 through 8 or 7 through 9 -- the practice varies from one state to another, and from one city to another. It is sometimes here, and sometimes as early as the elementary school, that tracking often begins.

Tracking is a bad policy idea that arose many years ago in the United States and Europe. Under tracking, the students are divided into tracks, or groups, according to their perceived intelligence. Those in the higher tracks were educated faster, and better, than those in the lower tracks. As the students progressed into secondary school, the knowledge and intelligence gap became wider.

Tracking was justified by the fact that adults need a wide variety of intelligence levels. Doctors and lawyers need more intelligence than most people. The argument was that grouping the more intelligent children into a faster track would free the teacher from the necessity of taking time to teach those of lesser intelligence.

Unfortunately, the decision as to which track to put a child in was too often based on the intelligence and achievement level of the child's parents, rather than the intelligence of the child. Also, some children appear to show lower intelligence during one particular year because of emotional problems, unusual pressures, or the like. Especially unfortunate was the lack of any provision for a student in a lower track, after intense "catching up" efforts, to be readmitted to a higher track. This is to be avoided.

A positive development in middle school is "learning how to learn." By the end of middle school, students must be able to read a book and learn from it without a teacher. This is a necessary skill because new inventions and discoveries occur throughout a person's life, and there is often the necessity of learning about them by reading. The amount of time necessary for learning how to learn must not be underestimated.

## SECONDARY SCHOOLS

The secondary school, also known as the high school, extends from the end of middle school through the twelfth grade. In some districts there is no middle school; there is only elementary school (K-8) and high school (9-12), as in the case of my own education.

In the United States, high school is the first level at which there are significant dropouts, meaning that students stop attending school in order to work or, in some cases, to raise their children. This is perceived by American high school teachers and administrators as a serious problem, and endless hours of planning are devoted to combating it.

Yet another example of what in our opinion is the inappropriate emphasis on North American and European issues by the Delors Report is its approach to the dropout problem. It correctly, I believe, identifies the real problem as arising from educational policies which prevent the dropout from returning to school at a later time. "The key principle," it recommends ([1], Chapter 6), "is to arrange for a variety of individual paths through schooling, without ever closing the door on the possibility of a subsequent return to the education system."

In fact, dropouts are not only a problem to students; they are also a problem to administrators who receive more money if they are in charge of more students (who do not drop out). However, we do not expect the dropout problem to arise in countries where access to secondary education by most children is very new. Such children, we believe, will be grateful for their opportunity to be educated and will not drop out in the same numbers that they do in the United States.

Besides the usual array of subjects, the secondary schools should endeavor to impart some more general knowledge. By the end of secondary school, students should, for example, have reasonable replies to the question, "Why, in your opinion, is the world changing so fast?"

We have specific concerns about two of the subjects customarily taught in high school. One is education about government. The students in every country should be taught about the governmental system that exists in that country. At the same time, they should be given a survey of governmental systems in other countries, with some understanding of how they work and why they work.

Our other concerns have to do with computers and what is taught about them, and by them. The first severe problem here has to do with undue emphasis on English. Certainly a knowledge of English is necessary in order to understand certain advanced computing material, but all too often computer people treat English as the only language in which computing can be done.

I call on the educational authorities of every country to insure that every student who is being taught computing in English is also taught computing in the national language of that country. Students should be using computers in Arabic or Thai or French or Chinese, depending on what is spoken in that country. I also call on educational authorities first to learn, and then to teach, that there is no one universal computer standard, no matter how many people say that Windows is the only possible operating system. I myself use a Macintosh, but there are many others, and there should continue to be more in the future, including those written in non-English-speaking countries. This has already happened in Japan.

Other bad educational ideas about computing include the attempt to have computers replace teachers, so that fewer teachers and therefore less money will be required, as well as teaching only specific systems with no attention paid to the idea of learning how to learn about computers and computer systems.

## EDUCATION ABOUT WORK

Before we go on to discuss university and college education, we should also mention another important aspect of education that is often overlooked. In the United States, the craft masters, such as master electricians, master carpenters, and master plumbers, are expected to pass written examinations in order to be certified. They are encouraged to take courses, requiring considerable study over several months, in order to be able to pass these examinations. It is easy to ignore this aspect of education in the United States if one talks only to people in colleges and universities.

## COLLEGES AND UNIVERSITIES

The terms "college" and "university" have become almost interchangeable in the United States, despite their initial distinction which arose from the colleges at Oxford and at Cambridge. Despite the large number of colleges, which collectively make up Oxford University and Cambridge University, the percentage of British people educated there remains quite small. Today Great Britain has a very large number of colleges, but it is still interesting (and dismaying) to hear people in other countries speak admiringly of "the Oxbridge system" as if the education of a tiny minority were good in itself.

All the considerations of learning how to use computers in one's own native language, discussed above under secondary schools, apply with even more force in college, where far more people are taught about computers than they are in the high schools.

Another important aspect of college education is that it be an opportunity for students to travel to another country. In recent years, the United States has become known as a country to which college students from all over the world are attracted. This aspect of American colleges should be imitated by countries in other regional groupings, which can give instruction in their own languages. Courses given in Spanish can attract students throughout Latin America; courses given in Arabic can attract students throughout the Arab world; and so on. Russia was well known for this before the breakup of the Soviet Union.

Concerning college education, the Delors Report notes: "The major danger is that of a gulf opening up between a minority of people who are capable of finding their way successfully about this new world that is coming into being and the majority who feel that they are at the mercy of events and have no say in the future of society..." ([1], Chapter 1). This remains true in all political systems. In particular, it is inaccurate to describe the majority in a monarchy as "hav[ing] no say in the future of society." This is true only when the monarch ignores the majority, as was the case with King George III of England.

Graduate education, and in general all college education beyond the first four years, should also be encouraged. It should not be necessary for students to travel to the United States or Europe to go to graduate school, or to do research.

## ADULT EDUCATION

As the world changes, adults need to be re-educated, and adult education, often called lifelong learning, is an important component of education in general. There are several important facets to this.

First there is adult education in the primary subjects. Adults who did not have the opportunity to learn reading, writing, and arithmetic when they were children should be given the opportunity to learn these as adults.

Then there is teacher re-education. It might seem that teachers are among those least in need of further education, when in fact they are among the most. It is destructive of general educational goals to find teachers teaching obsolete material, because this is all they know. In the area where I live, all secondary school teachers are required to take two courses every five years, as a condition of their continued employment.

Obsolescence is an essential feature of modern societies, and the pace of change is accelerating, rather than slowing down. Another consequence of this is the necessity for re-education of workers that is paid for by their places of employment. This is seen most obviously in computer classes, but in fact is more universal than this. Many such classes are given by colleges and universities, and others by private schools organised for this purpose.

Recently there has arisen the term "distance education," meaning "education at a distance [from the teacher]" and referring to education by television and over the Internet. This is primarily adult education, but can be useful at other levels as well.

## A FINAL ADMONITION

I urge the leaders of all countries to be prepared for the unusual amount of knowledge with which they will have to cope in the world of the future. A much greater number of citizens will have this knowledge than ever before. Listen and take heed. Your countries will be the better for it.

## REFERENCES

- Delors, J., et al., (1996). *Learning: The Treasure Within*, UNESCO Publishing, Paris.
- http://www.unesco.org/delors/task_force.html
- http://www.sofweb.vic.edu.au/news/unesconf
- http://www.unesco.org/delors/Calendar.html
- http://www.unesco.org/delors/chinaseminarlink.html
- http://nces.ed.gov/pubs/eiip

TEND 2000

## Crossroads of the New Millennium

# Empathy: A Paradoxical Key To Successful Human Learning Futures

Prepared and Presented

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**Workshop 1**

# Abstract

In this paper I argue that the concept *empathy* will be fundamental to successful human learning futures. However, while the need for empathetic education workers will increase, I will also suggest that the possibility of them being so will become increasingly problematic.

I first outline some conceptions of *empathy* and provide a brief argument for why the need for empathetic education workers is both morally obliged and practically necessary. Drawing on my own experiences as an internationally nomadic education worker, with a significant history of providing both actual and virtual learning activities, I use personal examples to explain the increased need for empathetic education workers. Specific examples are also used to suggest how this will also become increasingly difficult.

Finally, regardless of its problematic possibilities, I will suggest why education workers should not give up on continuing to be empathetic.

# Empathy: a Paradoxical Key to Successful Human Learning Futures

The privatisation of tertiary education, the growth in web-based learning technologies and other forms of distance education and the international mobility of a privileged cadre of knowledge workers sets the scene for immediate education futures. Under these conditions it will become more and more necessary for education workers to develop their empathetic skills, if they are sincere about helping students learn.

Knowing is fundamental to being empathetic and successful providers of formal education will be those who work hard at knowing students. However, knowing others is fraught with both philosophical and practical difficulties and dangers.

In this paper I first outline various conceptions of *empathy* before arguing how it will become an increasingly necessary applied concept for many future education workers. Drawing on my own experiences as an education worker, I will provide examples of how being empathetic can contribute towards student success. Finally, I will highlight the paradoxes and associated difficulties involved in trying to be empathetic, and conclude by suggesting why education workers should continue to be empathetic despite these apparent difficulties.

## CONCEPTIONS OF *EMPATHY*

Pratte (1992) claims that there are three forms of empathy. One is *empathetic distress*. This is an emotional response to another's distress that is sympathetic. Another is *empathetic anger*; a mixture of sympathetic distress for the other accompanied by a feeling of anger toward any culprit(s). And finally, there is *empathetic injustice*; a feeling beyond sympathetic distress and anger to one where we recognise that others may be benefiting from an unjust situation (ibid).

Others have somewhat different views on empathy. Stein (1970), for instance, argues that *empathy* means a particular way of considering others. When we empathise with others we engage in a *...kind of act of perceiving...[an] experiencing of foreign consciousness in general* (p. 11). Goldstein and Michaels (1985) argue that being empathetic is a case of *feeling together with another*, (p.7) defending their claims, in part, based on *einfuhlung*, the etymological origin of *empathy*, best translated as *feeling oneself into* (ibid. p.4).

While all these views resonate with *empathy* as commonly expressed - 'to put oneself in another's place' or 'to be in someone else's shoes' - there remains in the relevant literature a significant rift between two general positions. A rift hinging on how much one can **be** in someone else's shoes.

One common view is that empathy requires some kind of suspension of one's own personal situation and circumstances and a 'transference' of oneself into the life and experiences of another. Hartman (1984), for instance, argues that empathy requires a kind of 'fusion' between empathiser and empathisee, even if it just a temporary one (p. 233). Buber (1965) is in support by suggesting that:

> *Empathy is to glide with one's own feeling into the dynamic structure of an object (including man), and as it were, to trace it from within, understanding the formation and motorality of the object with the perception of one's own muscles; it means to transpose oneself over there and in there* (p. 97).

Stein, on the other hand, comments that ... *empathy, strictly speaking, is* **not** *'a feeling of oneness* (1970, p. 17). For her, empathy does not require 'complete fusion ('oneness')' and neither does it mean denying 'one's own concreteness'. She finds this objectionable because empathy, as a 'feeling of oneness', suggests a loss of what were originally two unique individuals. Empathy in terms of 'oneness' or 'fusion' can lead to a denial of the real and existing circumstances that persons find themselves in when actually relating to each other. And yet, if being empathetic requires a distinct sense of separateness, then there is always the risk that we do not get close enough to be able to recognise what kind of shoes others are wearing, never mind attempting to try them on. If this is the case, then we may fail to empathise and instead, sympathise with them. We may end up feeling **for** rather than feeling **with** the other (Goldstein and Michaels, 1985, p. 7).

This latter distinction that Goldstein and Michaels suggest adds further to the conceptual confusion when compared with Boyea's (1991) analysis. She argues that caring is different from empathy and it is caring that is associated with 'feeling **with** the other', **not** empathy. She claims that it is empathy that is associated with a 'feeling **for** the other' (p. 341). In contrast, Noddings (1984) offers a criterion for caring that is almost identical to the various conceptions of *empathy* mentioned earlier, those conceptions that require some sense of a denial of one's own 'concreteness':

> *When my caring is directed to living things... I try to apprehend the reality of the other. This is the fundamental aspect of caring from the inside ... displacement of my own reality to the reality of the other* (p. 14) ... *it is characterized by a move away from the self* (p. 16) [and] *involves stepping out of ones own personal frame of reference into the other's* (p. 24).

What can be concluded from these various (and confusing) claims then is that empathy is a feeling. It is not clear though whether empathy is a feeling **with** the other or a feeling **for** the other. Goldstein and Michaels claim it is the former, while believing the latter is indicative of sympathy. Boyea, however, believes that it is caring that requires feeling **with** the other, **not** empathy. *Empathy*, for her, is 'a feeling for the other (Goldstein and Michaels' *sympathy*). On the other hand, Noddings believes that it is caring that requires the 'displacement of one's reality' that others argue as being necessary for empathetic relationships.

Fortunately, there is a fundamental and common concern to be found in these various claims. It is a thread that weaves its way through the confusion and vagueness and one that signifies the concern each writer has for individual human beings and the human race in general.

I share this concern and henceforth will use *empathy* to express it. *Empathy* will be used from hereon to signify a sense of basic connectedness and 'we-consciousness' with others, best represented by feeling **with** others rather than feeling **for** others. To feel **with** someone implies a sense of we-ness and togetherness not necessarily reflected in feeling **for** someone. In using *empathy* so I am also stipulating that to feel with someone does indeed require that one 'fuses' with the other, but this is only temporary. Being empathetic necessarily requires a movement of the imagination between two individual selves that allows for both separation **and** 'fusion'. To understand how you see your world I must also understand the ways in which this is framed by how I see mine.

## WHY BE EMPATHETIC?

### i) The moral argument

Immanuel Kant perhaps best expounds the moral argument for why one should be empathetic. Inherent to his infamous 'categorical imperative', Kant argues all human beings deserve equal consideration of their needs and interests due to their fundamental moral worth as persons. Differences among individuals based on skin colour, gender, physical ability, ethnicity, intelligence, etc are all the outcomes of a genetic lottery and are irrelevant. The needs and interests of the individual bearers of any specific characteristics, traits and attributes should be all considered equally.

Equal consideration is not equal treatment. Equal consideration is necessary for, and prior to, fairness. Fairness is equal treatment of equals and unequal treatment of unequals. The needs and interests of all are considered equally but not all are necessarily acted on equally and hence, there can be variations in individual treatment.

Each society has its own practices and traditions that signify that some needs and interests are more valuable than others and these are evident in law, various ethics, norms and mores. A common example is found in the home. A family of parents and children has different needs at mealtimes but portions of food distributed among them are not always of equal amounts. Fairness demands that while all members' dietary needs are considered equally some get more or less food than others.

Equal consideration often demands that specific individuals, or even social institutions, have to act with vicarious prudence. They have to decide what the needs and interests are of those who cannot or are unable to decide these for themselves. For instance, teachers make classroom decisions for the good of the whole class and the individuals within it despite knowing that some of the students may not agree with the decision itself. A student may have a need to use a mobile phone in class but most teachers would prevent this for the student's own good and the class in general.

Consideration of the needs and interests of others requires **knowing** these needs and interests. Trying to judge what is the best course of action among various needs and interests, even differing or conflicting ones, demands that those involved try their utmost to know the needs and interests of all concerned.

However, just knowing the needs and interests of others is not enough. One must also try to understand the value of these needs and interests to the holders of them. For example, while I know that my son is very interested in playing computer games I struggle with understanding the value he gives to this activity. So while I might be flippant and inattentive when he wants to discuss ways of acquiring more games and playing them, to be fair I must listen to his requests with the kind of valuing that he gives to his interest. Only then would I be giving his needs and interests the consideration they deserve.

Being empathetic then involves both knowing the needs and interests of others and understanding the value these have to the possessor of them. Empathy enacted is a rich consideration of the needs and interests of others. And if equal consideration is morally required, then so too is empathy.

### ii) The practical argument

Most good teachers know that a student's learning is made easier when you can make connections between their personal interests and any required curriculum content. Presently, my son completes the academic requirements of his computer courses with ease and mostly fails everything else. There is a familiar argument here that he could be more academically successful if the courses that he is failing were somehow related to his interests.

In primary schools the connections between a student's personal interests and curricula requirements is sometimes evident in 'show-and-tell' activities. Teachers use various objects from each student's private lives to help them learn about curricula related topics. In higher education Doctorates of Education have been designed, in part, to provide an opportunity for students to theorise about some of their specific workplace problems and practices, and to receive academic credit for this. Their workplace needs and interests become the vehicles to achieve academic awards. I had increased success with my engineering students in Papua New Guinea when we examined local rope bridges to help them learn about vectors and forces. Dewey's (1989) philosophy of 'education through occupations' expresses this commonly held teachers' view writ large: Formal curricula requirements should be learned through work. An individual's occupation and/or occupational interests should be the vehicle for their 'general education' and ideally, both their occupational work and general education should serve a community need, which would be another 'interest'.

There are countless other examples to be found in the home, school and work that confirm that personal interest makes a significant difference in achieving given ends. This is especially the case in helping people learn.

When educators identify personal needs and interests among their students, and make connections between these and any curricula requirements, they are being empathetic. They are being empathetic for moral reasons, for learning efficiencies or both and the quality and extent of the empathy will vary dependent on context and the individuals involved.

## EMPATHY AND EDUCATION FUTURES: PARADOX AND PROBLEMS

### i) Education futures

Much of the near education future is predictable from the now. It provides good evidence that we will at least get 'more of the same'. For instance, many tertiary education institutions - especially universities - have experienced a decline in state support and as a result, have had to become privatised to one degree or another, seeking 'fee-for-service' students ('clients') in a competitive marketplace. Inherent to this competitive privatisation of tertiary education has been various articulations between universities, vocational, technical and community colleges and schools - both state/part-state supported and private. These articulations have usually taken the form of accreditation of programs and courses, and various amounts of academic credit towards further qualifications for individual students.

This increased articulation between tertiary education institutions has resulted in changes in 'traditional' student profiles. School, vocational and technical college students experience university life; university students experience community college life. Education workers within each of these sites increasingly have to work with students different from those that they have been used to. Dialect, accent, dress, personal values and beliefs - including the valuing of the educational institution itself and those who work within it - become more obviously varied. Much of the privatisation of tertiary education has been targeted at attracting 'international students'. Many education workers are having to work with new kinds of people.

Another obvious future trend is the continued growth in web-based learning technologies. While these have made articulation between educational institutions easier, the more resource-rich among them are also increasingly able to provide for potential students anywhere that on-line learning can be plugged in to. As a result, these institutions are also able to advance their already high profile. Potential students living in remote places with on-line access are more likely to be attracted to the 'big name' institution rather than their local, if personal costs are similar. The growth in web-based learning opportunities allows potential students to choose an institution regardless of differences in time and space.

Education futures will also include the continuing growth of the nomadic knowledge worker, either as a contract employee, consultant or both. The increased use of web-based technologies has opened up new global personal and professional relationships for many knowledge workers, including education workers. For many such workers then, not only are nation-state boundaries eroding, their personal identity blurs, as any sense of home becomes quite literally 'wherever I lay my hat'. Furthermore, 'my community' becomes a concept representing transience (as they move from one contract/consultancy to the next) and virtualness (as electronic groups and personal electronic communications become a dominant form of enduring personal connectivity to others). These education workers belong to multiple, virtual and transient communities where sometimes the most stable among them is the virtual.

All these trends suggest that education futures will create a marked decrease in the apparent ethnic and cultural homogeneity between education workers and students within particular teaching/learning transactions. This creates a paradox for education workers: The more they are 'less alike' from students the more they will need to be empathetic. However, this very increased diversity between education workers and students will at times make any attempt to be empathetic appear almost impossible.

### ii) Paradox and practical problems

Contemporary research in distance education (e.g., Ormsby, 1995) demonstrates that students drop out for two main reasons: 1) Insufficient communication with lecturers and other education workers and 2) Insufficient peer support. Both these could be construed as a lack of empathy.

Receiving reams of text in the mail or on-line without any apparent concern from the provider for the unique individuals who receive this information and the rich variety of contexts that they are a part of is an obvious recipe for unsuccessful learning. Authors of distance education materials contribute when they simply 'upload' their class notes for whoever wishes to access them remotely, and administrators contribute in the assumptions they make about students when responding to their enquiries by telephone or e-mail. Even when students are physically present on campus there is an understandable tendency to treat equally and all alike until something arises that warrants unequal treatment, e.g., extensions on assignments due to ill health. Given the increasing availability of web-based learning and the lack of preparation on the part of many education workers in dealing with a less homogenous body called 'the students', then being empathetic, will become both increasingly necessary and problematic.

As argued earlier, education workers, like all persons, are morally obliged to be empathetic towards others. As education workers per se, and also as argued earlier, there is an educational and practical imperative to be empathetic: Empathetic education workers are more likely to help students learn than non-empathetic education workers.

To achieve this, and analogous to Noddings' idea of teachers getting students to agree to … *a verbal commitment to the possibility of caring* (1984, p. 18), future education workers will have to become more committed to the possibility of being empathetic. In making this commitment each education worker's desire to be empathetic must …*[n]ot wait, Micawber-like, for a stimulus to turn up so that it may get busy; it actively seeks for occasions to pass into full operation* (Dewey, 1989, p. 48). And even though this does not necessarily require that education workers must **actually** empathise with all students, they have to agree to the **possibility** of this.

A commitment to the possibility of being empathetic requires education workers:

> *…seeing the world comprised of relationships rather than of people standing alone, a world that coheres through human connections rather than through systems of rules…where an awareness of the connections between people gives rise to a recognition of responsibility for one another, a perception of the need for response* (Gilligan, 1982, p. 29)

and also to

> *… interpret from as many vantage points as possible lived experience, the ways there are of being in the world* (Greene, 1988, p. 120).

Both Gilligan's and Greene's aims depend heavily on human communication. How can I develop a relationship with you without both of us learning about each other? How can we learn of each other's 'lived experience' without communicating?

Communication, and the quality of communication, becomes vital for both moral and educational reasons, but education futures will create some difficult communication problems.

The first and major problem for empathetic education workers is how will they communicate with students? It may well be that English is increasingly becoming a global language, but for many users English will remain a second or third language. Yet the providers of most web-based learning and international consultancies are likely to be native users of English.

Given the linguistic differences that will arise between future education workers and students, the least that must happen is that education workers are provided with professional development activities in EFL for learning purposes. At minimum, education workers must know how to create learning activities that 'speak' to a generic, non-native user. Education workers will also have to communicate with students in ways that take into account the cultures and contexts that each student is 'speaking' from and ways and means must be developed that allow and encourage students to 'speak'.

How a student's voice is heard is dependent on the teacher 'granting a hearing' (Jones, p309). Each teacher's presentation of themselves to students sends out overt and covert signals of the kind of 'hearing' that students may receive. The empathetic education worker must reflect on whether how they 'grant a hearing' to students might limit empathetic possibilities.

Even more critical is how education workers 'hear' each student's voice. In educational dialogue the most important voice is not the speaking voice, but the voice heard (Jones, p307). Most empathetic teachers in the HCT have particular difficulties with 'hearing' student's voices. Many students have limited English skills yet the curriculum is required to be taught and learned in English. Because of the language differences between HCT teachers and students, the idea of the 'voice heard' has to be stretched metaphorically to also include the physical presentation of the self and the student's behaviour. HCT teachers have to work hard in being empathetic as their 'hearing' the student becomes heavily dependent on how they interpret not just each student's limited use of another language (English) but how they dress, how they carry themselves and how they behave and react in specific circumstances. Because of a lack of knowledge and experience, what often happens is that teachers, like any other people, simply and understandably project their own meanings onto students' behaviour and then judge accordingly. For example, many new teachers to the Middle East ascribe regality and royalty to males wearing the traditional dishdash, and act accordingly. Those who have been in the Middle East a bit longer learn that a white, flowing robe does not necessarily imply a royal gown and that it is sometimes even akin to jeans as worn in the West. Conceiving of the dishdash as jeans consequently leads to changes in perceptions of, and behaviour towards, students.

Another practical problem that the suggested paradox creates for future empathetic education workers is that while all persons deserve an empathetic hearing (by virtue of their personhood) not all people, including students, are able. Even if we assume that anyone employed to help another person learn should and is able to act empathetically, we cannot assume the same of some students. Many are not old and/or mature enough. This puts many an education worker in the difficult situation of acting empathetically towards students when getting nothing but grief in return. However, by virtue of the age, experience and professional training of the education worker, they are obliged to continue to act empathetically. Ironically, this will be more frustrating where education worker and students share culture, contexts and language as a common understanding of these is obviously more conducive to empathising. Where these are not so common similar problems are still likely to arise. Here is an example.

I was using the college gym in Abu Dhabi and listening to 'western' music. A student entered the gym and switched the radio off without comment. I asked him why and he made a limited attempt (due to his poor English skills and my non-existent Arabic skills) at informing me of the inappropriateness of such music in a Muslim context. Now this student is just one individual who obviously does not speak for all Muslims. My needs and interests apparently got no consideration, nevermind equal consideration, and his were obviously considered by him to be paramount. On another day I might have made the situation into a 'learning opportunity' for both of us. I could have reminded him that the HCT is a multicultural/multinational enterprise where life is quite often one of continual negotiation between different (sometimes wildly) needs and interests, and sometimes communicated very badly, if at all. But I didn't. I rapidly considered where 'he was coming from', said nothing and continued exercising without music.

### iii) Paradox and moral problems

Perhaps more problematic is the possibility that in the previous example my needs and interests did not receive equal consideration not because of an individual inability but fundamental cultural, even moral, differences that suggest that *empathy* itself is not as universally demanded as I believe Kant's categorical imperative implies.

Much of recent educational theory has promulgated the discourse of difference and the 'other', where once hidden similarities between claimed different people are found, and real difference celebrated. While much of this theory is marshaled to advance a democratic ideal, as central to the '... *development of a multivoiced and equitable culturally diverse society*' (Jones, p299), its shortcomings are also relevant in the furthering of empathy by education workers towards students as argued here.

Some students live and learn in cultural contexts where the relationships between them and education workers hinder or preclude empathy. For some students the teacher is highly esteemed and the provider of all the 'right' answers. Consequentially, the teacher's needs and interests should always be given greater consideration than those of students. In such circumstances teachers can get away with pretty much whatever they want in classrooms - hours of didactic instruction, easy to write and administer tests and most classroom activities decided by the teacher. No fear of 'independent learning' and 'empowerment' here.

Perhaps an even greater moral problem is to be found in those cultural contexts that are antithetical to 'outsiders' learning about 'locals'. Male teachers working in women's colleges within the UAE tread a dangerous path in trying to learn more about their students in order to help them learn. Many female UAE students purposefully present themselves so that men in public see no part of their flesh. A public, educationally intended knowing of students by male teachers can become easily interpreted as desire, replete with colonial hangovers of the mystery of the sexual and dangerous exotic. While empathy is both morally obligatory and educationally beneficial, the very concept may be imbued with assumptions and presuppositions that limit its enactment in specific contexts.

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Jones suggests that the historically dominant western assumption that all knowledge is available to the individual who reasonably seeks it just does not apply to some settings, and hence thwarts any attempts at being empathetic. She argues that western knowledge and colonisation are both premised on the ideal of making visible the entire natural and social world. But the accessibility of all knowledge to all people is not a view shared by indigenous peoples, such as Maori, for whom access to certain knowledge must be actively granted. Knowledge comes with particular responsibilities and powers, and therefore is not necessarily made available to those who simply 'want to know' (p311). The future empathetic education worker working on-line or in the 'real' may well be sincere in wanting to know and understand students but much of this may well be off limits. And perhaps here is the fundamental paradox that produces both major moral and practical problems: How will education workers know that the very concept that they are employing to help students learn is not allowed between them?

## WHY KEEP ON EMPATHISING? KNOW THYSELF

There is a moral obligation and good practical reasons for education workers to continue being empathetic towards students despite the previously discussed problems. But perhaps a more immediate and tangible reason for continuing to be empathetic is the opportunity it affords to learn about oneself.

Empathy is a relational concept. Being empathetic is not just about trying to put myself in another's shoes. It is also about trying to understand how the world from my shoes frames how I can even hope to see the world from yours. The relational aspect of empathy requires that I know myself as much as I know you.

For education workers this requires that they reflect on some of the assumptions and beliefs they have about others and the relationships they believe they should and/or do have with them. In being empathetic they should try to suspend these assumptions and beliefs and, as Merleau-Ponty suggests, 'put them out of play'...

> *Not because we reject certainties of common sense and a natural attitude to things - they are, on the contrary, the consistent theme of philosophy - but because, being the presupposed basis of any thought, they are taken for granted and go unnoticed, and because in order to*

> *arouse them and bring them into view we have to suspect for a moment our recognition of them* (Merleau-Ponty in Greened 1988, p. 122).

Much of what is 'common sense', 'taken for granted' and 'unnoticed' in the daily, unreflected work of education workers are cultural products, dependent on specific contexts and histories. Education workers' perceptions of specific phenomena are based an assumptions and beliefs that are taken as 'common sense' due to their intimate and regular familiarity. Variations in cultural contexts and histories between education workers and students can give rise to different perceptions of specific phenomena, including those phenomena considered by either of them as 'common-sense'.

Differences in perceptions of apparently 'common-sense' phenomena can get perceived pejoratively. The alternative - recognising that 'common sense' might not always be so 'common' or 'sensible' - involves a level of self-reflection that demands much more intellectual energy than pejorative attributions of others. Take language, for example. It is too easy for some native users of a language to associate non-native use of the same language as expressive of an inferior or under-developed intellect. If I communicate with a student whose native language is dissimilar to mine, and we attempt to communicate in my language, then the student will inevitably try to translate from his native language to mine, and as result, use my language differently to me. But knowing all this makes a difference in how I understand and relate to students. For instance, in teaching Arabic students and using English, knowing that the Arabic language does not include an equivalent to the English *be* completely changes my relationships with them when they say *The engine hot* rather than *The engine is hot*. Before this knowledge I may well have associated *The engine hot* with a child-like use of my language or worse still, evidence of a less-developed or inferior intellect. Self-reflection on my language and a better understanding of the student's language together contributes towards preventing this. I change the ways that I can better help students learn by being empathetic towards them.

## CONCLUSION

Much of immediate education futures can be predicted from the present. The increasing privatisation of tertiary education within a globalised distance education marketplace and the use of web-based learning technologies will radically change the mix between education workers and students. The increasing international mobility of the nomadic education worker and their immediate families will add to this mix.

Education workers must communicate with students as best they can to help them learn. Communication is necessary for empathy, and empathy is both morally obliged and practically beneficial, both educationally and generally. Diverse mixes of people with common educational ends makes communication between them even more vital.

Education futures suggest that education workers and students will increasingly interact with one another regardless of differences in cultures, contexts, time and space. This creates a pragmatic paradox: Because communication within immediate education futures will involve restricted body language and physical presence, the use and interpretation of words will become even more crucial. Non face-to-face dialogue and clarification will become increasingly necessary but the very mediums of communication will make this difficult.

The increased diversity among education workers and students within education futures also creates a moral paradox: The need for empathetic education workers will increase, and **being** an empathetic education worker will become harder, but communications between some groups and about some things will be just not allowed.

Despite all these misgivings future education workers should continue to be empathetic for perhaps selfish reasons. Empathy furthers cross-cultural understanding and like Jones, I remain convinced that:

> *... cross-cultural understanding, in that it leads to a deeper understanding of one's* ***own*** *culture, and history, and their political relation to those of others, is crucial to any desirable future, and any just structural social change* (p314).

However, my aim for education workers in continuing to be empathetic is less far-reaching: While knowing myself does not necessarily contribute to successful student learning, not knowing myself contributes to my helping students less than I could. And not knowing students as best I can compounds this. If I learn that for some students empathy does not apply or can only be limited in its use, then while this may limit how I can help students learn, I will have learnt something important about myself and the view from my own shoes. Hopefully, this will effect the way I help future students learn.

## REFERENCES

- Boyea, A., (1991). "Existential Primaries, Metaphors for Ethics: Dominion and Caring" in *Philosophy of Education Society 1992: Proceedings of the Fourty-Eighth Annual Meeting of the Philosophy of Education Society*, Illinois State University, Normal, Illinois.
- Buber, M., (1965). *Between Man and Man*, Collier Books, New York.
- Dewey, J., (1989). *Freedom and Culture*, Prometheus Books, Buffalo, New York.
- Gilligan, C., (1982). *In a Different Voice: Psychological Theory and Women's Development,* Harvard University Press, Massachusetts.
- Goldstein, A. P. and Michaels, G. Y. (1985*). Empathy: Development, Training and Consequences,* Lawrence Erlbaum Associates, New Jersey.
- Greene, M., (1988). *The Dialectic of Freedom*, Teachers College Press, New York.
- Hartman, J. J., (1984). *Discussion in Empathy* edited by Lichtenberg, Bornstein and Silver, The Analytic Press, Lawrence Erlbaum Associates, London.
- Jones, A., (1999). "The Limits of Cross-Cultural Dialogue: Pedagogy, Desire, and Absolution in the Classroom" in *Educational Theory*, summer, Volume 49, Number 3, pp299 - 316.
- Kant, I., (1981). *Grounding for the Metaphysics of Morals*, translated by James W. Ellington, Hackett, Indianapolis.
- Noddings, N., (1984). *Caring: A Feminine Approach to Ethics and Moral Education*, University of California, Berkeley.
- Ormsby, H. L., (1995). *A Distance Training Programme for Teachers of Mexican Indian Languages*. Centro de Investigaciones y Estudios Superiores en Antropologia Social (CIESAS), Mexico.
- Pratte, R., (1992). *Philosophy of Education: Two Traditions*, Charles C. Thomas, Illinois.
- Stein, E., (1970). *On the Problem of Empathy*, Martinus Nijhoff, The Hague.

TEND 2000

Crossroads of the New Millennium

# Islam And High-Technology: Global Communications and Cultural Re-Inventions

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Workshop 1

# Abstract

Conventional views consider technology to be a historical phenomenon with culturally transformative authority. According to this view, not only does technology transform local cultures towards a universal/western homogeneity, it also provides solutions to its own negative social and environmental consequences. Since the beginning of the industrial age, western proponents of industrialisation, on the one hand, and the advocates of the integrity of local cultures, on the other, have rendered technology and tradition irreconcilable. That is to say, technology undermines the social significance of tradition. With the advent of computer-based business administration, mass-communication, and entertainment, this assertion has gained more prudence. The so-called post-industrial development further complicates the predicament of the unregulated technology, both in terms of the sovereignty of the nation-state and of traditional modes of social organisation.

In this paper I would like to problematise the bifurcation of technology and tradition and its implied unidirectional transformative authority of technology. Through using examples from forty eight Islamic web sites, the operations of which I have been following for four years, I shall argue that Muslim identities are incessantly being reinvented and reconstructed via, rather than despite of, new technologies. My study demonstrates that a conscious appropriation and appreciation of technology not only does not undermine cultural distinctiveness, but it may also enhance the production of a more vibrant cultural environment. I shall also argue that the proponents of technology-tradition binary perceive tradition as a set of static practices, a social order incapable of generating and adapting to change.

# Islam and High-Technology: Global Communications and Cultural Re-Inventions

## INTRODUCTION

This workshop is held under the general theme of "Culture at the Crossroads." The crossroads to which this general theme alludes is the technological transformation at the turn of the millennium in the ways of learning, communicating, transferring and storing knowledge, and envisioning socio-economic development. Each of these distinct spheres of technological transformations, the theme suggests, poses a threat to the integrity of "Culture" —here used deliberately in the singular. My goal in drawing attention to this singularity is by no means a lexical quarrel or an editorial comment on the English grammar of the conference documents. Rather, I would like to problematise the theme by arguing that culture is a set of social practices and rituals in a particular universe of meaning within which these practices are legitimised, maintained, and perpetually reinvented. As such, culture, both temporally as well as spatially, is plural and invariably in the state of becoming. Therefore, regardless of their historical epoch, cultures exist at crossroads.

The emphasis on the fluidity of culture and its constant state of becoming gains more relevance when we examine the predicament of the contemporary velocity of technological innovations in the context of Islamic societies. Whereas the most advanced industrial societies struggle with the legal, cultural, and political ramifications of high technology, often, thanks to the legacy of Orientalism, the detriments of the same problems in Islamic societies are regarded more gravely. Whether with good or bad intentions, Orientalists did create a discourse in which Islam, on account of its static, non-historical nature, became the main obstacle to progress for Muslims. According to this discourse, whereas technological innovations and change are integral parts of the advanced industrial nations, Muslim nations inevitably have to either favour their "static" cultures or embrace new technologies and adapt to their culturally transformative authority.

Just to provide one example from a long tradition of the Orientalist depictions of Islam, in his book, *Islamic Fundamentalism and Modernity*, W. M. Watt identifies five reasons for the causes of the Islamic societies' backwardness (all the citations are from pp. 5-20):

(i) The Unchanging Static World. "For Muslims unchangingness is both an ideal for human individuals and societies, and also a perception of the actual nature of humanity and its environment." While for the western mind the idea of development is an integral part of their consciousness and change is a phenomenon that comes to be part of the general outlook of life, for Muslims there is "no place for development, progress, or social advance and improvement." Muslim thinkers show no conception of development and "the idea of social reform is thus virtually unthinkable for traditionally minded Muslims." Hence, according to Watt, in all areas of human thought and social condition Muslims assume the absence of change. He further speculates that "the concept of the unchangeableness of human nature and the absence of any belief that humanity is capable of developing towards an intrinsically better form of society" might be related to the otherworldliness of Islam. And as the evidence to the otherworldly orientation of Islam, he points to the willingness of young Iranians to face martyrdom in the war against Iraq.

(ii) The Finality and (iii) The Self-Sufficiency of Islam: Islam claims that it is the final religion. This claim is based on the belief that the Jewish and Christian scriptures have been corrupted (altered), and hence, "it is irrational to adhere to them after coming of the Qur'an." Watt contended that "the belief in the self-sufficiency of Islam, together with the suspicion of all that is not Islamic and the reluctance to borrow from alien cultures, continues at the present time. . . Muhammad is reported to have said, 'Seek knowledge, even from China,' but . . . Muslims were unwilling to seek knowledge even from the alien cultures within their empire."

(iv) Lack of Historical Awareness: Nomadic Arabs, according to Watt, had only a very limited historical awareness, they thought in terms of generations rather than of years and decades, and centuries went beyond their ken. "They had no long perspectives, since most tribes had existed for only a few generations. There was no conception of a continuing historical process such as described in the Bible. This lack of historical awareness may have contributed to the absence of a concept of development."

(v) The Idealisation of Prophet Muhammad and Early Islam: Since Muhammad was held to be perfect in every way, associated with the perception of the place of Islam in world history was an idealising and romanticising of the first Islamic state and the whole period of the Rashidun Caliphs. Thus, as long as the idea of state and development is closely connected to the life of Muhammad and his Companions, any deviation from the earlier model of Islamic state, Watt observed, was regarded as heresy by the *ulema*.

Therefore, according to this scheme, social change for Muslims remains an exogenous force to which they ought to accommodate (or conversely to resist, as allegedly in the case of Islamism). This view inevitably creates a binary of the Change-Generating West *versus* Change-Resisting Islamic Societies. As Bassam Tibi (1990), one of the proponents of this viewpoint, reiterated, the main predicament of Muslims is to find ways to culturally accommodate social change, a process which they perceived to be hostile to their "metaphysical and theocentric world view." Therefore, Tibi rhetorically asked, is "Could Muslims appropriate modernity while rejecting the world view related to it?" (1990: 43).

Questions such as Tibi's are ideologically laden towards a particular notion of modernity. In this depiction, on the one hand, in the realm of politics, modernity is equated with a secular liberal democracy, and on the other hand, in the realm of economy, it is evaluated on the basis of technological advancement and the efficiency of society's techno-scientific organisation. There is, however, another important implicit assumption in this accommodationist approach which is more related to the topic at hands in this workshop: *the unidirectional transformative authority of technology*. This is one of the oldest predicaments in human society, which is how tools influence human relations and social organisations.

At the risk of simplifying various arguments about the relation between technology and culture, I shall divide the multitude of responses to this relation into three categories:

1. Technology as the messenger and the message: In every historical period, philosophers and politicians as well as masses of people look upon new inventions with skepticism. The skeptics have always argued that technology is not merely a tool to make things easier for human beings. Rather, it sets forth a Faustian bargain, doing things easier, faster, and more efficiently, in exchange for a spiritless, impersonalised society. In this view, technology is not only a messenger, but a message as well; it is not only about *how to,* but also about *what to.*
2. Technology as a messenger without an inherent message. A second group has emphasised the *instrumental neutrality* of technology. That is to say, technology may be appropriated and manipulated under any condition for any purpose. Who has access to and control over technology determines its social implications. In this view, technology is solely a messenger which has nothing to do with the message; *how* to do things is the realm of technology, *what* needs to be done is the responsibility of human agency.
3. And finally, technology as a messenger unaware of its message. Technology professes a transformative authority the outcome of which is unpredictable.

## TECHNOLOGY *IS* THE MESSAGE

The idea of technology as the message or an essence is best known through the writings of the German phenomenologist Martin Heidegger and the French social critic Jacques Ellul. Both Heidegger and Ellul argued that technology constitutes a new type of cultural system that restructures the entire social world. In a famous epithet Ellul asserted that "Technique has become autonomous" (1964: 14), that is to say that it has established its own logic and advances independently from human interventions. In a similar manner Heidegger lamented that technology has irreversibly overtaken us and has transformed the entire world, ourselves included, into "standing reserves," raw materials to be mobilised in technical processes (1977: 17). For both Ellul and Heidegger, there are no escapes from the ills of technological societies other than a retreat, "only a return to tradition or simplicity offers an alternative to the juggernaut of progress" (Feenberg, 1991: 7)

Whereas Ellul and Heidegger viewed the transformative authority of technology pejoratively, Marx welcomed technological development as one of the fundamental conditions of progress. In one of his famous aphorisms, Marx remarked in his *Poverty of Philosophy* that "hand-loom gives you society with the feudal lord; the steam-mill, society with the industrial capitalist." This apparent technological determinism constructs technology as a cultural system that restructures the entire social and symbolic world as an object of transformation. In this regard, not only does technology execute our thoughts and ambitions, it also defines and shapes them. In a remarkable passage Marx concluded his treatise on the *German Ideology* by interweaving the symbolic world of culture and rituals to the advent of technology. "Is Achilles possible," he asked,

> When powder and shot have been invented? And is the *Iliad* possible at all when the printing press and even printing machines exist? Is it not inevitable that with the emergence of the press, the singing and the telling and the muse cease; that is, the conditions for epic poetry disappear? (1972: 150)

Marx's attempt to connect the symbolic and cultural conditions of life to technology was neither unprecedented, nor unusual. Before him, as Neil Postman (1993) observed, scholars found it useful to invent taxonomies of culture based on the technological character of an age. Even the most common form of public conception of historical periodisation is based on technological classifications: the Stone Age, the Bronze Age, the Iron Age, and the Steel Age. Today Arnold Toynbee's conception of the Industrial Revolution as the social marker of the last two centuries seems an indisputable historical fact, the same way the Daniel Bell's notion of post-industrial society has become a foundational basis through which we make sense of our socio-economic and cultural experiences.

Finally, as Marshall McLuhan once declared in the title of his 1967 classic, *The Medium is the Massage.* The life and time of typographic cultures of "the Age of Gutenberg," McLuhan (1994) posited, has been replaced by Electronic cultures of "the Age of the Electronic." I shall return to this topic later.

## TECHNOLOGY: MEANS WITHOUT A MESSAGE

The second category is based on a fundamental distinction between technology and its application. That is, technology lacks the substantive content of its own and serves as a tool in the hands of its users. Formulated both by the liberal proponents of industrial development as well as the Bolshevik advocates of Marxism, this view considers technology to be neutral in its constitution which conveys no inherent agenda for socio-political and cultural change. This view treats technology as subservient to values established in other social sphere, such as politics and culture. Accordingly, the advocates of this view regard technology as a pliable tool, which can be appropriated in a variety of social relations.

The most important implication of this approach is that technology is universal and may be applied in any social and cultural circumstances despite the contexts within which it is implemented.

## TECHNOLOGY THE MESSENGER WITH AN UNPREDICTABLE MESSAGE

It is a liberal as well as a socialist naïveté to regard technology a socially neutral tool for the betterment of social and individual life. The socio-cultural implications of technology are ecological. That is to say, a society which introduces private automobiles as the main means of transportation is not the same old society plus cars. A new means of transportation will transform the way people relate to one another through the construction of new conceptions of time and space. But whereas the first approach considers this transformation to be unidirectional and guided by the inherent characteristics of technology, this third view argues that the social and cultural implications of technology are unpredictable.

Since the ancient times, technology has been looked upon with skepticism. This skepticism emanates from the fact that the social and cultural consequences of the appropriation of technology are unknown to its inventors. For example the mechanical clock which has its origins in the Benedictine monasteries of the twelfth and thirteenth centuries was invented to keep a more precise regularity for the seven periods of prayer during the course of the day. The bells of the monastery were to be rung to signal the canonical hours; the mechanical clock was the technology that could provide precision to these rituals of devotion. And indeed it did. But what the monks did not foresee was that the clock would become a means not merely for keeping track of hours but also of synchronising and controlling the actions of men. And, as Lewis Mumford wrote, "The mechanical clock made possible the idea of regular production, regular working hours and a standardised product" (Mumford, 1963: 15). Simply put, without the mechanical clock, capitalism would not have been possible.

Here the paradox is unmistakable. A tool that was invented to regulate men's devotion to God, contributed to the emergence of capitalism, an economic relation and a social ethos in which the only devotion is to the accumulation of money. A tool, which was to encourage precision in Divine rituals, resulted in a more efficient measurement of economic productivity. A tool, which was introduced to divide up the day into periods of spiritual reflections, became an instrument of the compression of time for the purpose of speed and greed. The same holds for other major inventions in human history, most notably printing press, invented by Gutenberg, a devout Catholic, which played a significant role in the emergence of the Reformation. It was Martin Luther who described printing as "God's highest grace, whereby the business of the Gospel is driven forward."

It is a mistake to suppose that technology has a one-sided effect, either as a *burden* or inversely as a *blessing*. "Every technology is both a burden and a blessing; not either-or, but this-and-that" (Postman, 1993: 5). Every culture negotiates with technology; the question is whether it does it intelligently or deterministically.

The last point is of a major importance. How does each culture negotiate its relations with technology? Are there any moral, political, cultural, or religious values that restrict or guide technological advancement? Does technology follows its own internal logic, or should it be regulated and contained in relation to the specific needs and cultural priorities of different societies? If yes, who does determine these values and priorities and how?

We live in an electronic age. However, technologies which define this historical period, the digital means of mass communication and networking were invented for radically different purposes from what they actually became utilised for. While in its formative stages globalisation was often viewed as an integrative, homogenising force which would assert itself through the transformative authority of high technologies (thus the notion of "the global village"),[1] it has created a "frame of unity" within which diverse socio-cultural formations compete (Featherstone, 1990).

There are three spheres within which the new technologies have asserted unintended implications: 1) in the sphere of politics, the ways through which global communications undermine national sovereignty and the laws of nation states; 2) particularly in Islamic societies, it has democratised access to knowledge and consequently blurred the distinction between the *'alim* (the expert) and the *'ami* (the layperson); 3) it has also blurred the distinction between the teacher and the technocrat, that is the production and transfer of knowledge from its management and distribution.

Here I would like to focus on the last two points and draw attention to the contradictory role that global communications and high technologies play in the formation of new cultural forms and identities, its blessings and burdens.

It is superfluous to say that Muslims neither practice a single tradition, nor do they follow the same cultural norms and values (Asad, 1986; Gilsenan, 1982). Although the attempt to construct a universal canonical Islam is not new, the new means of global communication and electronic networking have made it more feasible to construct a simulacra of the *ummah* (global Muslim community) and authenticate its premises with references to the Islamic Text and the Prophetic Tradition (with a capital "T"), albeit with an inauthentic language (Al-Azmeh, 1993).

The invention of a universal Islamic tradition and its manifestation in a global mass movement is one of the consequences of the postmodern means of communication and networking. As one observer remarked, "The message of Islam is not simply available from a preacher at a local mosque. Sermons and religious education from leading preachers and writers can be transmitted to every city and village" (Esposito, 1984: 212). The unprecedented number of pilgrims to Mecca, the spread of the "message of Islam" by cassette tapes and electronic mail are contributing to the construction of the concept of Islam as a uniform traditional practice and a cultural system. In Michael Gilsenan's words, "in the name of tradition many traditions are born and come into opposition with others" (1982: 15).

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[1] This image is largely promoted by the mass media to the extent that "it is as if," as Ronald Robertson observed, "the printing press largely promoted *Gesellschaft*, and the satellite dish — and its potential miniaturization— is promoting global *Gemeinschaft*" (Robertson, 1992: 396).

The formation of large post-colonial Muslim communities in Europe, and the rapid influx of Muslim students in the mid 1970s, due to the sharp increase in the oil prices, have created a significant Muslim Diaspora in Europe and North America. The Muslim Diaspora is one of the main sources of production of this perceived universal Islamic culture. The Muslim Diaspora's construction of a universal cultural identity in the West is, one the one hand, an attempt to take part in the cultural politics of the "multi-cultural" West, and on the other hand, it is an effort to sway the national politics of their home country.

In the last ten years, numerous web sites have been established through which the claim to Muslim cultural universality is constructed and maintained. A typical cyber-Muslim site on the web carries news about Islamist movements; organises discussion groups about controversial religio-political and cultural issues; discusses politics of assimilation in the West; utilises (humanitarian) support for Palestinians and Bosnians and Albanians (during the civil war), answers frequently asked questions about Islam and Islamic rituals; announces prayer times; and finally broadcasts the audio version of Friday sermons.

While the spread of cassette tapes and other forms of electronic communications contributes to the construction of a homogenous Muslim culture, we need to examine who has access to the production of knowledge, how is this knowledge maintained, legitimised and reproduced; and finally who is benefiting from its production.

As I mentioned earlier, one of the implications of global communications is the emergence of a new generation of Muslims who are not trained in seminaries and other traditional institutions of Islamic learning. Whereas this transition democratises access to religious knowledge, it could potentially transfer the authority of the learned teacher to the skilled technocrat. This is an important point when we consider the possibilities of long-distance learning in higher education. Knowledge of Islam and its legitimate practices can also be acquired in the comfort of one's home as well as in the remote corners of seminaries. Moreover, more and more people now claim authority to the interpretation of the Divine text and its implications for the contemporary social and cultural life.

Mr Amir Jafri is one of the people who were instrumental in producing *'Alim Software*. The production of knowledge is becoming more and more a technocratic endeavor, as the producer of this particular piece of software has no formal training in Islamic theology or jurisprudence.

As a way of concluding, I would like to reiterate the points I made in this brief introduction that technology ought to be negotiated and defined in every cultural context. There is no authority inherent in technology which transforms societies towards a predetermined form of social and cultural order. Indeed, history has proven that the inventors of new technologies often are unaware of the actual ways in which those technologies transform societies. Technology is neither bad nor good, it is a blessing *and* a burden, how to alleviate the latter and take advantage of the former is the topic about which I would like to invite all the participants to share their views and thoughts. Are there any specific examples in the area of your expertise that culture and technology have been negotiated successfully? Can you offer any examples of community-building through digital means of networking? Are there any particular experiences of cultural devastation induced by technological change? Are you aware of any specific examples of regulating technology based on political and cultural considerations? Questions are many and time is short, the floor is open.

## REFERENCES

- Asad, (1986). *The Idea of an Anthropology of Islam,* Centre for Contemporary Arab Studies, Occasional Papers Series, Georgetown University.
- Azmeh, (1993). *Islams and Modernities,* London & New York: Verso.
- Ellul, Jacques (1964). *The Technological Society,* trans. J. Wilkinson, New York: Vintage.
- Esposito, (1984). *Islam and Politics,* New York & Oxford: Oxford University Press.
- Featherstone, (1990). "Global Culture: An Introduction", *Theory, Culture, and Society,* No. 7.
- Feenberg, (1991). *Critical Theory of Technology,* New York, Oxford: Oxford University Press.
- Gilsenan, (1982). *Recognising Islam,* London: Croom Helm.
- Heidegger, (1977). *The Question Concerning Technology and Other Essays,* translated and with an introduction by William Lovitt, New York: Harper Torchbooks.
- McLuhan, Marshall, (1994). *Understanding Media: The Extensions of Man,* Cambridge: MIT Press.
- McLuhan, Marshall, (1967). *The Medium Is the Message,* New York: Hardwired.
- Marx, Karl, (1972), *The German Ideology,* New York: International Publishers.
- Mumford Lewis, (1963), *Technics and Civilisation,* New York: Harcourt Brace Jovanovich.
- Postman, Neil, (1993). *Technopoly,* New York: Alfred A. Knopf.

- Robertson, (1992). "Globality, Global Culture, and Images of World Order," in H. Haferkamp & N. Smelser, eds. *Social Change and Modernity,* Berkeley & Los Angeles: University of California Press.
- Tibi Bassam, (1990). *Islam and Cultural Accommodation of Social Change,* Boulder, San Francisco, & Oxford: Westview Press.
- Watt W. M., (1988). *Islamic Fundamentalism and Modernity,* London & New York: Routledge

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## Crossroads of the New Millennium

# Reading At The Crossroads: English For Workplace Purposes

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Workshop 1

# Abstract

This paper will detail a research project conducted in Brunei Darussalam, a small sultanate in South East Asia. The project involves the collection of questionnaire data from vocational education teacher trainees and a representative group of their future students. The purpose of the questionnaire is to have respondents think about the function of reading in vocational education and compare teacher views of reading in English with student views of reading in English. Data was collected from 150 students in University, Nursing College and Vocational College.

The paper will describe the design of the project and particularly the theoretical underpinnings of the questionnaire (Freebody and Luke, 1990, 1993). Finally, the paper will present the findings of the study and reflect on the potential of critical literacy perspectives in English as a Foreign Language (EFL) especially in vocational education.

# Reading at the Crossroads: English for Workplace Purposes

## INTRODUCTION

Few would now argue that literacy in any language is simply the ability to read and write without taking into consideration aspects of the social purpose for which these skills are utilised. Cook-Gumperz (1986) initially identified this perspective when they wrote,

> Literacy is not just the simple ability to read and write: but by possessing and performing these skills we exercise socially approved and approvable talents; in other words literacy is a socially constructed phenomenon. (Cook-Gumperz 1986:1)

Augmenting this view of literacy in the social sphere is the recent discussion by Luke (1995) which records historically the construction of reading as behaviour, Luke says,

> In its short 100-year history … reading has been redesigned substantially: from a means of communication with divinity and a means for moral development, to reading as behavioural skills, to reading as deep linguistic processing and a 'pyscholinguistic guessing game,' to reading as a vocation. (Luke 1995:96)

This impression of reading as a vocation is a compelling one - Luke (1995) critiques a model of reading that assumes that what one reads in a non-fiction workplace text is clear and unambiguous where readers and writers go about their daily work doing what the workplace texts tell them. Given that literacy is a social process and that the meaning of what is written is mediated through the individual's social world consequently reading can never be seen as a foregone conclusion. An investigation of how student readers report that they read workplace texts and the way they find the meanings inherent in these texts may prove an informative exercise for a teacher of reading to vocational education students.

This paper seeks to: (a) reflect further on the social construction of literacy and the place of reading in the 'new times' workplace (b) describe the design of the project and particularly the theoretical underpinnings of the questionnaire (Freebody and Luke, 1990, 1993, 1999) and (c) reflect on the potential of critical literacy perspectives in English as a Foreign Language (EFL) especially in vocational education.

Hence the paper will be divided into three sections.

Part A: Literacy studies and 'new times'.

Part B: The questionnaire and results.

Part C: English for vocational purposes into the new millennium.

## PART A: LITERACY STUDIES

This section will review and present some of the current theoretical perspectives in literacy as a socially constructed phenomenon, and; to argue that like literacy's social context - all classroom practice comes from a social position fixed in both a theoretical framework and a practice milieu. Teachers or university lecturers therefore cannot overlook these broader aspects of the teaching of English or English as a foreign language curriculum.

There has been an extensive range of theoretical discussions of what has been termed as 'literacy studies' in recent times. Literacy studies encompasses research and practice which focuses on reading, writing, listening and speaking for making meaning rather than as mechanical skills - with meaning being part of the social world rather than an individual cognitive state. There are, of course, differing versions of literacy studies - functional literacy, cultural literacy and critical literacy and other versions have been written about (Street, 184, 1992; Cook-Gumperz 1986; Heath 1986; Kress, 1985; Gee 1990; Green and Harker 1988; Fairclough 1992; Halliday 1992.)

The following main premises (after Anstey & Bull 1996:153) serve to organise this review: (i) literacy is an everyday social practice which individuals participate in; (ii) literacy is not a neutral practice but relates to how individuals read the world; (iii) literacy is a political enterprise; and, (iv) that the pedagogy of literacy empowers and disempowers particular social groups.

### *Literacy is an everyday social practice which individuals participate in*

Literacy is not something that happens only at school but is an on-going social process that all language users are involved in. Moreover, there are different sorts of literacies and languages - not just literacy and language as single entities.

When we use language we participate in social events and this participation is coordinated by our specific identities. What is important is not the words but the larger and more specific coordinations of which they are part. Gee (1990, 1992) calls these coordinations Discourses (as opposed to discourse which he refers to as being connected stretches of language). Gee (1996:6) uses the following to further explain this notion of Discourses - imagine the identity kit used to play the role of Sherlock Holmes. It would contain certain clothes, certain ways of speaking and writing, certain attitudes and beliefs and certain ways of interacting with others. When all these factors are together they become the 'Sherlock Holmes Discourse'. Others could be male factory worker, female academic in a South East Asian University, a member of a nature society etc.

Using Gee's (1990) concept, each individual may move through and participate in a number of Discourses everyday, each of which has a way of talking, dressing, reading, writing etc. This view sees literacy as ways of behaving and using literacy, that is literacy practices. Furthermore, in answering the question of how does one acquire a Discourse, Gee (1990) claims that the process is similar to second language acquisition. Discourses are mastered not by overt instruction but by 'apprenticeship' in social practices with people who have already mastered the Discourse (see Rogoff 1990 for further discussion).

In what ways is literacy acquired inside and outside school? is a question worthy of investigation. Scribner and Cole's (1981) important study with the West African Vai examined the relationship, which is held paramount in the west that; schooling and literacy are associated processes. Scribner and Cole (1981), after making observations using ethnographic techniques, documented the uses of literacy by the Vai people in three languages. Following analysis of this vast data they found that the types of literacy, with their attendant social consequences, were mediated by where the literacy was used. For example: English literacy is associated with government and education; Vai literacy is used primarily for keeping records and for letters - often pursuing commercial matters; and Arabic literacy is used for reading, writing and memorising the Koran.

The study also aimed to answer the question: "Is it literacy or formal schooling that affects mental functioning?" Scribner and Cole based on what they found put forward an account of ' a practice account of literacy' - a type of literacy that enhances the cognitive skills that are practiced in carrying out those skills. So they argue that literacy in any language promotes mental functioning.

### *Literacy is not a neutral practice but relates to how individuals read the world.*

Freire (1987), a well known Brazilian educator is noted for his work in using education and literacy to assist members of subordinate groups to achieve freedom. He states:

> It is impossible to carry out my literacy work or to understand literacy by divorcing the reading of the world from the reading of the world. Reading the word and learning how to write the word so one can later read it are preceded by learning how to write the world, that is, having the experience of changing the world and touching the world. (Freire & Macedo 1987)

Thus, having students read English texts purely for the purpose of looking at the language of the text is naive - are we not asking students to bring their world views to the text and thus further their own reading of the world.

### *Literacy is a political enterprise.*

> All educational practice implies a theoretical stance on the educator's part. This stance in turn implies - sometimes more, sometimes less explicitly - an interpretation of man (sic) and his world. (Freire 1970:205).

Curriculum always involves making selections from the culture and from the myriad of possible literacies - whether conceived of in terms of psychological skills and behaviour, or individual growth and self-development. The literature we select, the methods and strategies that we use to teach and assess, and the knowledge and competencies we teach selectively to different groups of students, are selections from the plurality of cultures extant in English speaking countries.

Let us look again a Gee's (1990) Discourses discussed earlier - he argues that Discourses are intimately linked to 'the distribution of social power and hierarchical structure in society' (Gee 1990:4-5). So having control of certain Discourses can bring material wealth or political power. Being literate in these Discourses can provide cultural capital and thereby access to power (Luke 1996) so we should simply be able to teach our students the linguist elements of the Discourse and they will have access to power. Street (1996) argues that this is still not all language learners need to have to have access to powerful institutions. Literacy on its own when acquired by the poor or unempowered may have cultural capital but they still lack the power to turn their learning into real value in that society.

### *The pedagogy of literacy empowers and disempowers particular sociocultural groups.*

The study conducted by Heath (1982) suggests that for the children of Trackton and Roadville there was a mismatch between literacy practices of those at home and at school. This mismatch was due in part to the differences in the way in which each community addressed language to children at home. Further the types of questions asked during school time were different from those asked at home for the students of Trackton.

Michaels' study of sharing time (1986) took place in a Year 1 classroom where half the students were African American and half were non-African American. Michaels identifies this sharing time as a gatekeeping encounter in the classroom and identifies that the two different groups of students have very different ways of sharing information. Michaels shows that the teacher had difficulty collaborating with Deena, a student from African American background. Michaels' study suggests that teachers may benefit from learning more about the discourse and interactional structures from students' homes and communities.

A recently reported study by this author outlines one community's understanding of literacy pedagogy in one primary school as being rules of classroom interaction. This is reflected in more recent studies in classrooms that focus on school literacy practices (Freebody, Ludwig & Gunn 1996, Ludwig & Herschell 1998). The parent actually comments that:

> Dark Kids are overlooked when a response to the teacher is required in class, the kids are disadvantaged in class - they need more practice at responding so they'll get better and then praised for their efforts - this is a form of literacy. (Cox & Webb 1999)

There is no doubt to researchers and practitioners alike that literacy pedagogy, which is currently in practice in schools, empowers and disempowers certain groups.

I would like to conclude this section by referring to Gee's (I 994:190) words:

> English teachers can co-operate in their own marginalisation by seeing themselves as 'language teachers' with no connection to the social and political issues. Or they can accept the paradox of literacy as a form of interethnic communication... and accept their role as persons who must socialize students into a world-view that must be looked at critically, comparatively, and with a constant sense of the possibilities for change.

## PART B: THE QUESTIONNAIRE AND ITS THEORETICAL BASE

Gee's statement that student's must have a world view that can be looked at critically, comparatively and with a constant sense of the possibilities for change particularly in the context of vocational education begs further exploration. In terms of reading this exploration is possible by referring to the recent work by Freebody and Luke, (1990, 1993) Luke and Freebody, (1999), Luke (1995) and Freebody, (1990). These works all refer to four roles that a successful reader needs to develop and sustain to play out these four related roles.

### Code-breaker

A successful reader must be able to break the code to engage with the text. Breaking the code refers to successfully matching the sound-symbol relationship and the linking of that relationship to meaning. Much has been written about these two systems and their role in reading. Some advocate that breaking the code is enough for reading, but it is clear that there are further elements necessary for successful interaction with a written text.

### Text-participant

This refers to the ability of the reader to engage with the meaning and structure of the text. Much of the recent work on reading comprehension, schema theory and guided reading are working in the area of text-participant. Having student readers bring their own basic understandings and experiences to the text that they are reading together with an understanding of the genre enables readers to predict what might be coming next in the story or factual text.

### Text-user

This role refers to the readers' ability to take the meaning of the text and use it to work within their social or vocational world. It is the skill of knowing how to read the set reading of a chapter of the textbook for the University lecturer - of knowing what is in the chapter and how that content relates to the lecture topic and assessment piece. Furthermore, the reader should be able to discuss this in a tutorial situation and bring other world-knowledge to bear on the discussion.

### Text-analyst

It is in the explication of this role that Freebody and Luke, (1990, 1993) Luke and Freebody, (1999), Luke (1995) and Freebody, (1990) significantly expand familiar interpretations of critical reading. Readers utilising this role must be aware that texts are crafted objects, written by persons with particular orientations to the information. Freebody (1993) says that there are particular ways that texts operate and make the reader into operator, often covertly.

The development of these questionnaires to assess the nature of students' thoughts about their own reading derived from an assumption by the researcher, that EFL teachers in the vocational education field are resourcing learners for each of the roles outlined. However, these teachers are not as aware as they might be about the power inherent in resourcing their future workforce with such reading abilities. Hence, the title of this paper which identifies reading at the cross-roads - where practitioners are at a point in the development of theory about the teaching of reading that allows more complex interrogations of text once the fundamental aspects of reading are complete. This study is no more than exploratory in nature and that any findings that the researcher makes will serve to illuminate this complex area of EFL teaching.

## TRIAL INVESTIGATION

Prior to the development of the instrument the researcher had two very experienced secondary English teachers in Brunei Darussalam prepared EFL lessons with reading activities which focussed on the four roles of the reader. This series of lessons were conducted by the teachers and the students participated well in the planned and unplanned question and answer sessions. The finding of this simple trial investigation was that the teachers reported that the student body did not have enough English language to utilise the roles of text-user and text-analyst. It is the current research's intention to further investigate this claim and to elucidate the interrelated factors of English as a second language and reading.

## THE STUDY

The questionnaires are completed by either, (i) students in vocational education programmes or (ii) their teachers and a number of student vocational education teachers.

Below in Figure 1 and Figure 2 are the questionnaires. A cover sheet is also included to elucidate further information about the participants in the study (some examples of questions are: age, gender, vocational training area, length of course, institution etc.)

Student questionnaire

**When you read English workplace texts (instructions, overviews, manuals, etc) in your job or during your vocational training do you:**

| Student Questionnaire | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Think about what you already know about this topic. | | | | | |
| 2. Work out the contents of this text (e.g., words, illustrations etc). | | | | | |
| 3. Read the text. | | | | | |
| 4. Think about the meaning of the text. | | | | | |
| 5. Think how this text can help you do my job. | | | | | |
| 6. Think about how you can use the information in the text. | | | | | |
| 7. Decide if this text gives you options to improve your practice. | | | | | |
| 8. Think about if you can find this information in any other place. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 9. Think about what can change the meaning of the text. | | | | | |
| 10. Ask is the text trying to change my ideas about my work. | | | | | |
| 11. Ask is it encouraging me to buy something or change the products that I use. | | | | | |
| 12. Ask is this text serving the interests of one type of worker more than others | | | | | |

1= never 5= always

**Figure 1. Student questionnaire**

Teacher questionnaire

**When you ask your students to read English workplace texts (instructions, overviews, manuals, etc) in teaching do you expect them to ask themselves the following questions.**

| Teacher questionnaire | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 13. What do I you already know about this topic? | | | | | |
| 14. What are the contents of this text (e.g., words, illustrations etc)? | | | | | |
| 15. Can I read the text? | | | | | |
| 16. What is the meaning of the text? | | | | | |
| 17. How this text can help me do my job? | | | | | |
| 18. How can I use the information in the text? | | | | | |
| 19. Does this text give me options to improve my practice? | | | | | |
| 20. Can I find this information in any other place? | | | | | |
| 21. What could change the meaning of the text? | | | | | |
| 22. Is the text trying to change my ideas about my work? | | | | | |
| 23. Is it encouraging me to buy something or change the products that I use? | | | | | |
| 24. Is this text serving the interests of one type of worker more than others? e.g. male or female, boss or worker etc. | | | | | |

1= never 5= always

**Figure 2. Teacher questionnaire**

## *Results*

### Student questionnaire

The data was analysed using the SPSS statistical package in order to identify trends and patterns in the responses of the students to the 12 questions in the questionnaire. The data set consisted of 117 completed questionnaires, with 39 male respondents and 78 female respondents. Table 1 below outlines the fields of study of the 117 respondents.

*Table 1* *Field of study of student respondents*

| **Field of study** | **Frequency** | **Percentage** |
|---|---|---|
| Automotive | 4 | 3.4 |
| Computer | 3 | 2.6 |
| Electrical Engineering | 1 | 0.9 |
| Nursing | 97 | 82.9 |
| Plant Operator | 7 | 6 |
| Engineering | 1 | 0.9 |
| Manufacturing Engineer | 1 | 0.9 |
| Refrigeration & Air conditioning | 3 | 2.6 |
| Total | 117 | 100 |

It is clear that Table 1 identifies Nursing students as the highest category of respondents (82%) - this is in part due to the process of data collection. First access was made to the Nursing College and the data was collected from one large class at one time. The range of other fields of study offers a promising overview of other vocational areas for the purpose of the data analysis.

The questionnaire employs a Likert scale with 5 categories of response - *always, usually, sometimes, rarely*, and *never*. High scores indicate that students always or usually think about this role of the reader. For the purposes of further analysis the questionnaire results were divided into four groups of items: Code breaker; Text participant; Text user; and, Text analyst.

Table 2 below identifies the mean response and standard deviation of the sample of students to the four sub-scales. Clearly the students are most likely to give thought to aspects of the code breaker and text participant roles of readers. They are less likely to give thought to aspects of the text user and text analyst. There is a reasonably consistent level of agreement across the first two roles. The means reflect an agreement level of around three - or *sometimes*.

*Table 2* *Student response according to four sub-scales across sample*

N = 117

| Sub scale | Range | Mean | Std. Deviation |
|---|---|---|---|
| Code breaker | 3-15 | 10.12 | 2.32 |
| Text participant | 4-15 | 10.19 | 2.23 |
| Text user | 3-14 | 8.91 | 2.21 |
| Text analyst | 3-14 | 8.14 | 2.42 |

Further insight may be possible by looking at an analysis by gender may allow further insight. Table 3 shows that there are no significant differences within the gender analysis - the types of thinking while reading vocational education materials is similar for both genders.

*Table 3* *Analysis by Gender*

N= 117 Male = 39 Female = 78

| | **Male** | | **Female** | |
|---|---|---|---|---|
| Sub scale | Mean | Std Deviation | Mean | Std Deviation |
| Code breaker | 10.33 | 2.57 | 10.01 | 2.18 |
| Text participant | 10.53 | 2.61 | 10.02 | 2.11 |
| Text user | 8.61 | 2.08 | 9.06 | 2.26 |
| Text analyst | 8.48 | 2.39 | 7.96 | 2.43 |

Similarly, further insight may be possible by looking at a further analysis by work experience. Yet, Table 4 indicates that there are also no significant differences between responses by those who have been in the workforce and those who have not. Of some interest here is the indication that those with work experience indicates that they usually think about how what they are reading in the text can help them do their job (text participant). This focus on text participant is repeated in the analysed data from the teacher questionnaire and will be discussed in the final section of the paper.

*Table 4* *Analysis of student's questionnaires by work experience*

N = 117 Have work experience = 38 No work experience = 79

| | **Work** | **Experience** | **No work** | **experience** |
|---|---|---|---|---|
| Sub scale | Mean | Std Deviation | Mean | Std Deviation |

| | | | | |
|---|---|---|---|---|
| Code breaker | 9.92 | 2.13 | 10.21 | 2.41 |
| Text participant | 10.31 | 2.56 | 10.14 | 2.17 |
| Text user | 9.84 | 2.13 | 8.47 | 2.11 |
| Text analyst | 8.58 | 2.45 | 7.92 | 2.38 |

## Teacher Questionnaire

The data was analysed using the SPSS statistical package in order to identify trends and patterns in the responses of the students to the 12 questions in the questionnaire. The data set consisted of 21 completed teacher questionnaires. Table 5 below outlines the location of teaching of each of the 21 respondents.

*Table 5* *Teaching location*

N=21

| **Vocational College** | **Frequency** | **Percent** |
|---|---|---|
| Jefri Bolkiah College of Engineering | 9 | 42.9 |
| Sultan Saiful Rijal Technical College | 7 | 33.3 |
| Sultan Bolkiah Vocational School | 3 | 14.3 |
| PAPRSB Nursing College | 2 | 9.5 |
| Total | 21 | 100.0 |

Table 6 reflects the data collection sample - a number of vocational teacher education students at University Brunei Darussalam were approached to complete the questionnaire. The sample contains a number of early career teachers who have had little teaching experience or time in industry.

*Table 6* *Teaching and industry experience of teacher respondents*

| | **Teaching Experience** | **Industry Experience** |
|---|---|---|
| 1-5 years | 16 | 16 |
| 5-10 years | 0 | 0 |
| 10-15 years | 1 | 1 |
| More than 15 years | 4 | 1 |
| | - | 3 |

Furthermore, Table 7 indicates that the teachers conceive of reading in the traditional manner - as a code breaking activity, with some reflection on the meaning of the text (text participant). Again, the relative importance of the reader as a text participant is highlighted here and is further accentuated when the analysis in Table 8 is perused.

*Table 7* *Response according to four sub-scales across the sample*

N=21

| | **Mean** | **Std Deviation** |
|---|---|---|
| Code breaker | 10.62 | 1.65 |
| Text participant | 11.42 | 1.94 |
| Text user | 9.28 | 2.02 |
| Text analyst | 8.47 | 2.31 |

Table 8 outlines again the significance placed on the questions in the sub scale of text participant by the teachers in the sample. The questions ask the reader if they: think about the text; think about how this text can help the reader do their job; think about how the information can be used.

*Table 8* *Mean response to sub-scales across industry and teaching experience*

| | **Industry Experience** | | | **Teaching Experience** | | |
|---|---|---|---|---|---|---|
| | *1-5yrs* | *10-15yr* | *15+yrs* | *1-5yrs* | *10-15yr* | *15+yrs* |
| Code breaker | 10.81 | 9.0 | 11.0 | 10.14 | 9.0 | 9.75 |
| Text participant | **11.56** | **10.0** | **12.0** | **11.44** | **9.0** | **12** |
| Text user | 9.31 | 9.0 | 10.0 | 9.25 | 8.0 | 9.75 |
| Text analyst | 8.50 | 9.0 | 9.0 | 8.44 | 8.0 | 8.75 |

By looking more closely at the questions and the frequency of responses across both groups of respondents it is clear that these questions are answered favourably by respondents.

*Table 9* *Percentage of students answers to text participant questions*

| | Q4. Think about the meaning of the text | Q5. Think about how this text can help me do my job | Q6. Think about how I can use the information in the text. |
|---|---|---|---|
| 4. Usually | 38% | 57% | 47% |
| 5. Always | 24% | 14% | 23% |

413

*Table 10 Percentage of teachers answers to text participant questions*

| | Q4. Think about the meaning of the text | Q5. Think about how this text can help me do my job | Q6. Think about how I can use the information in the text. |
|---|---|---|---|
| 3. Sometimes | 35% | 34.2% | 9.4% |
| 4. Usually | 28.2% | 27.4% | 28.2% |
| 5. Always | 20.5% | 13.7% | 14.5% |

Clearly the text participant questions produced answers that indicate that both students and teachers usually or always think about aspects of meaning while reading. A reader as a text participant refers to the ability of the reader to engage with the meaning and structure of the text. Much of the recent work on reading comprehension, schema theory and guided reading are working in the area of text-participant. Having student readers bring their own basic understandings and experiences to the text that they are reading is an essential process for the exact meaning to be gained from the text. Yet, this finding is disappointing for the researcher as it indicates that most instruction in reading must therefore remains steadily in this area of reading in vocational education within this context.

Clearly after the code breaker role the role of text participant is the most important - but the seemingly decrease of engagement with the other roles is disquieting. Table 11 illustrates this trend.

*Table 11 Evidence of declining engagement in reader roles of text user and text analyst by students*

| Question number | Mean response by students | Std deviation of response |
|---|---|---|
| Q7 | 3.5897 | 1.0517 |
| Q8 | 2.9316 | 1.1121 |
| Q9 | 2.3761 | 1.0232 |
| Q10 | 2.7350 | 1.0779 |
| Q11 | 2.7436 | 1.2117 |
| Q12 | 2.6581 | 1.0518 |

This study sought to examine aspects of reading by vocational students and their teachers in Brunei Darussalam. This paper reports some of the exploration possible through the data and its analysis. Further refinement of the instrument and a wider data collection process may enable more significant results to be attained. Yet, as such the data and analysis indicates that students are competent in the roles of text code breaker and text participant - even that teachers in the sample value text participant responses highly. Yet rarely (less than 30% of student responses) do they indicate that they engaged in more sophisticated and more socially orientated reading behaviour.

## PART C: ENGLISH FOR VOCATIONAL PURPOSES INTO THE NEW MILLENNIUM

In summary, this paper seeks to conclude by reflecting on the implications of teachers who continue to conform to the traditional, skills-based, psychological, and progressivist models of reading. I would like to suggest, that these teachers work from a model where reading is seen as an individual skill that can be taught in isolation in the classroom. Rather than a social skill that allows the reader to unlock the sociopolitical contexts and issues continually surrounding the reader in the workplace and in their daily lives.

Luke (1995) suggests that,

> *Reading instruction constructs a relationship between text and reader.* This relationship is not one that is "reflexive" or "interactional" as described in cognitive and psycholinguistic theory, but it is a social relationship in which the relative authority/agency of text and reader is shaped up - it is, in sum, the relationship of knowledge and power.

So what of this aspect of knowledge and power in the area of EFL in vocational education, is it an important area when students are struggling just to break the code? Many view looking at reading from a social perspective as a luxury add-on, or as just too hard, or as the teachers in the trial investigation for this paper reported that the student body did not have enough English language to utilise the roles of text-user and text-analyst. Should we just leave it - and have the students worry about developing a critical perspective when they graduate or after they become competent in the work place procedures.

We refer again to Luke's earlier work (1992) where he summarises 'new times' thus,

> Many analyses point to a twenty-first century employment market characterized by diminishing life-long employment guarantees; firms that change products, services, technologies on short notice to compete in multinational markets and to accommodate corporate take-overs, buy outs and consolidation; work increasingly accommodated by part-time or subcontracted employees. (Clark, 1990) cited in Luke (1992:9)

Is it not then, our role, as English literacy teachers to have our students competent in the four roles of the reader - most particularly that of the text-analyst?

## REFERENCES

- Anstey, M. & Bull, G (1996). *The Literacy Labyrinth.* Sydney: Prentice Hall.
- Bull, G. and Anstey, M. (eds.) (1996) *The Literacy Lexicon.* Sydney: Prentice Hall.
- Cook-Gumperz, J. (1986). Introduction. In *The social construction of literacy*. Cambridge: Cambridge University Press.
- Cox, R. (1998). *Knowledge about language: system and pedagogy.* Unpublished Ph.D. thesis, James Cook University, Australia.
- Cox, R. & Webb, G. (1999). "Literacy in its broadest sense: The ASSI literacy project". In ***Australian journal of language and literacy*** Vol 22, No 2.
- Fairclough, N. (1992). *Critical language awareness*. London: Longman.
- Freebody, P (1990). "Reading discourse research." In *Australian Journal of Language and Literacy*. 13 (4).
- Freebody, P. (1993). "A socio-cultural approach: resourcing four roles as a literacy learner." In Watson and Badenhop (eds.) *Prevention of reading failure*. Sydney: Ashton Scholastic.
- Freebody, P., Ludwig, C. & Gunn, S. (1995). *Everyday literacy practices in and out of school in low socioeconomic urban communities*. Brisbane QLD: Griffith University.
- Freebody P. and Luke, A (1990). " Literacies programmes: Debates and demands in a cultural context.", *Prospect: A Journal of TESOL*. 5 (3).
- Freire, P (1970). "The adult literacy process as cultural action for freedom." In *Harvard Educational Review*, 40, p 2O5.
- Freire, P. & Macedo, D. (1987). "Rethinking literacy: A dialogue." In *Literacy: Reading the word and reading the world*. London: Bergin and Garvey.
- Gee, J. (1990). *Social linguistics and literacies: Ideology in Discourses*. London: Falmer Press.
- Gee, J. (1992). "Socio-cultural approaches to literacy (literacies). " In *Annual Review of Applied Linguistics* 12, 31-48.
- Gee, J. (1994). "Orality and literacy: From savage mind to ways with words. " In Maybin, J. (ed.) *Language and literacy in social practice*. Clevedon UK: Multilingual Matters.
- Gee, J. (1996). "Literacy and social minds." In Bull, G. and Anstey, M. (eds.) *The Literacy Lexicon*. Sydney:Prentice Hall.
- Gee, J (1997). "Meanings in Discourses: Coordinating and being coordinated. " In Muspratt S., Luke, A. & Freebody, P. (eds.) *Constructing Critical Literacies*. Sydney NSW: Allen and Unwin.
- Green, J. & Harker, J (eds) (1988). *Multiple perspective analyses of classroom discourses*. Norwood NJ: Ablex.

- Heath, S. B. (1986). *Ways with words.* Cambridge: Cambridge University Press.
- Halliday, M. (1985) *An introduction to functional grammar.* London: Edward Arnold.
- Kress, G. (1985). *Linguistic processes in sociocultural practice.* Geelong Australia: Deakin University Press.
- Lankshear, C. (1998). *Changing literacies.* Buckingham: Open University Press
- Ludwig, C. & Herschell, P. (1998). "The power of pedagogy: Routines, school literacy practices and outcomes." In *Australian journal of language and literacy* 21 (1) pp 67-83.
- Luke, A, (1995). "Rethinking Literacy in New times." In *Teachers College Record,* 97 (1) pp. 95-115.
- Luke, A. (1996). "Genres of power? Literacy education and the production of capital." In Hasan, R. & Williams, G.(eds) *Literacy and Society.* London: Longman.
- Luke, A. and Freebody, P. (1999). "A map of possible practices: further notes on the four resources model." In *Practically Primary.* 4 (2) pp. 5-9.
- Micheals, S. (1986). "Narrative presentations: an oral preparation for literacy with first graders." In Cook-Gumperz (ed) (1986) *The social construction of literacy.* Cambridge: Cambridge University Press.
- Rogoff, B. (1991). *Apprenticeship in thinking.* New York: Oxford University Press.
- Scribner, S. & Cole, M. (1981). *The Psychology of Literacy.* Cambridge, USA: Harvard University Press.
- Street, B. (1984). *Literacy in theory and practice.* Cambridge: Cambridge University Press.
- Street, B. (ed.) (1991). *Cross-cultural approaches to literacy.* Cambridge: Cambridge University Press.
- Street, B. (1996). "Literacy and power?" In *Open Letter* 6 (2) p7-17.

TEND 2000

## Crossroads of the New Millennium

# Culture: A Filtration Process During Communication In Education

Prepared and Presented

By

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**Workshop 1**

# Abstract

A brief review of structural communication models, a discussion of some elements that affect the communication process in education provides the introduction to the workshop. A learner's perception varies and is affected by several factors, one of these being the receiver's cultural and social status. It can be argued that culture in its widest sense is expressed and embodied in most facets of a person's life. Culture, expressed in laws and precepts, governs how an individual can or must behave within a particular society; it determines how educators will approach their students or how a medical doctor will communicate with his/her patient, to name but a few.

The focus of the workshop is on the filtration process of culture during communication in education with reference to visual elements. Culture is a lens or a filter through which people receive, interpret and transmit educational messages. Communication in the educational process is an open system and takes place within a cultural environment. This environment affects the sender, the receiver and the relationship between the sender and the receiver. These concepts are graphically presented by a model as a process that takes place within a cultural environment.

# Culture: a Filtration Process during Communication in Education

Researchers and theorists have developed several models and theories in order to explain and predict the process of communication. A review on the current state of communication theory by Neuliep (1996) provides an impression of the breadth and depth of this scientific field. Neuliep cites and briefly discusses more than seventy theories and then states that they do not include all the research that has been done in this field. It is, therefore, nearly impossible to provide a review of all the theories and all the models that predict and explain these theories. The introduction to the workshop will provide a brief review of some models that appear to be applicable to the focus of the workshop. These models are graphic representations of theories that attempt to predict and explain the process of communication and related activities. A graphic model is useful in that it can portray a psychological process that would normally be difficult to define, and can be used to describe and explain the working of such a process. A model also simplifies reality, can present abstract concepts, and can portray individual concepts and their relationship with each other.

## SIMPLE COMMUNICATION MODELS

Possibly, the first model of communication is Aristotle's model of linear communication, which can be extrapolated from his writings. This model accounted for a one-way form of communication and included the speaker, the message, and the audience or listener.

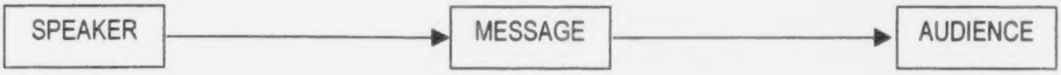
A well-known statement on communication, and one that has been structured into a model, is made by Laswell (1948), who stated *"Who says what in which channel to whom with what effect"*. Laswell's model added the concepts of the "*medium*" and the "*effect*" that the message has on the receiver. The "*who*" signifies the sender or communicator, the "*says what*" the message, the "*in which channel*" the medium, the "*to whom*" signifies the audience or receiver, and the "*with what effect*" signifies the impact.

Shannon and Weaver (1949) introduced the concept of "noise" in the communication process. Their model explained the process of communication in telecommunication, from when the message is sent from the source, through the transmitter, to the receiver and the final destination. The noise signal, also known as interference in other models, affects the signal, which in turn is one reason why communication fails.

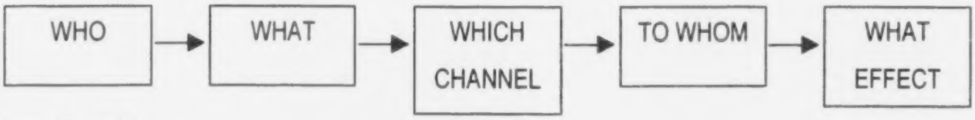
The three models cited above are all linear models in that they do not require or allow feedback or interaction with the sender or the information source. Simplified representations of the linear models are given in Figure 1.

FIGURE 1

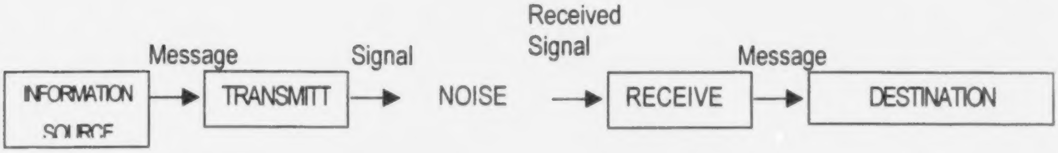
A simplified representation of three linear models of communication.


SPEAKER
MESSAGE
AUDIENCE

Aristotle's model


WHO
WHAT
WHICH CHANNEL
TO WHOM
WHAT EFFECT

Laswell's model


INFORMATION SOURCE
Message
TRANSMITT
Signal
NOISE
Received Signal
RECEIVE
Message
DESTINATION

Shannon and Weaver's model

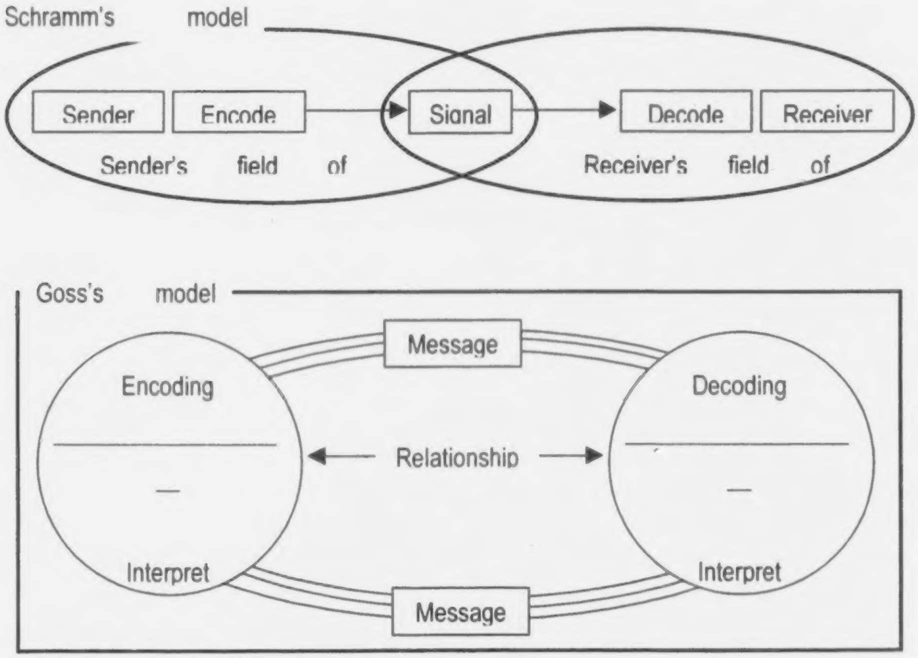
Schramm's structural model portrays an overlap between the sender's and the receiver's field of experience. This overlapping field of experience is the area where effective communication occurs.

Another structural model proposed by Goss in 1983 takes into account psychological and social concepts of communication. This model emphasizes an interaction or relationship between sender and receiver resulting in a cyclical communication process. The communication process is a circular process that takes place within a certain context where two persons have a social relationship. The message can also be encoded and decoded on three different levels, namely a verbal, a vocal and a non-verbal level.

The focus of the SMCR (Source, Message, Channel, Receiver) model, proposed by Berlo, outlines the factors or the characteristics that affect the sender and the receiver in the communication process. Culture and attitudes can, for example, affect the sender or source; the contents of the message and the code, for example, affect the message; sensory perceptions affect the channel; whilst culture and attitudes, for example, can affect the receiver. The models of Schramm and Goss introduce the sender's and receiver's experience as well as a relationship or an interactive process between the sender and receiver. Berlo's SMCR model further defines smaller ingredients in the communication process that in turn affect different steps in the communication process. Schramm's, Goss's and Berlo's models are given in Figure 2.

**FIGURE 2**

The communication models of Schramm, Goss, and Berlo.


Schramm's model
Sender
Encode
Signal
Decode
Receiver
Sender's field of
Receiver's field of
Goss's model
Message
Encoding
Decoding
Relationship
Interpret
Interpret
Message

| **Source** | **Message** | **Channel** | **Receiver** |
|---|---|---|---|
| Communication skills → | Elements → | Seeing → | Communication skills |
| Attitudes | Contents | Hearing | Attitudes |
| Knowledge | Treatment | Touching | Knowledge |
| Social system | Structure | Smelling | Social system |
| Culture | Code | Tasting | Culture |

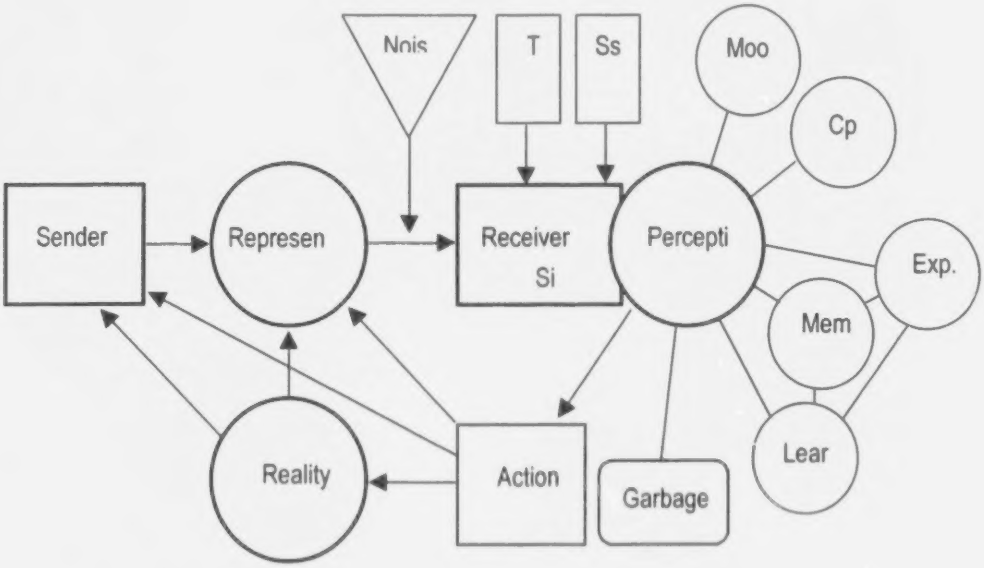
Berlo's SMCR model (1960)

## MORE COMPLEX MODELS

A structural model, more from a visual communication and visual literacy perspective, was proposed by Pettersson in 1982 (cited in Pettersson, 1993). Pettersson stated that many of the previous models that attempt to incorporate the increasing number of variables fail to incorporate a perception process. A receiver's perception of a message varies because of his/her sociocultural status, experience, mood, cognitive processes, and stage of development. Perception, in turn, is removed from the representation or the message, which is in turn removed from reality. A viewer or receiver can thus understand the message, as stated by Pettersson, as "*garbage*". They can also understand the message correctly, act, and provide feedback to the sender. Pettersson's model in given in Figure 3.

**FIGURE 3**

Pettersson's 1982 communication model (from Pettersson, 1993:5).



T = Time and stages of development, Ss = Cultural and social status, Represen. = Representation, Si = Sensory impression, Cp = Cognitive processes such as intelligence and creativity, Exp. = Experience, Learn. = Learning, and Mem. = Memory.

The seven models of communication that were discussed in the preceding paragraphs have shown certain similarities, namely that there is always a sender (source / speaker), there is always a message (representation) and there is always a receiver (listener). The basis of a basic communication model, as in Aristotle's case, could consist of these three elements. The models have shown a growth in complexity where these three main components have been augmented by additional objects, for example the concept of a "*channel*" by Laswell, and the concept of "*noise*" in the Shannon-Weaver model. Communication models have been developed further by incorporating a process of experience between the receiver and sender as depicted in the Schramm model, and a process of interaction through a relationship between sender and receiver as in the Goss model. The Goss model further introduces the influence of the environment on the communication process as a whole. The models of Pettersson and Berlo further interpose several objects in the models that affect the stages, objects or processes in a communication process, namely culture, social system, mood and sensory impression, to name but four of these objects in the models.

A convergence model proposed by Rogers in 1986 depicts a communicative relationship between two participants where several cycles of information exchange occur during a communication process. This cyclical process conveys and exchanges information before mutual understanding occurs. The value of this model is that it indicates that communication between the learning material and the person receiving the material must take place even though the learning material is static and cannot actively contribute to the cyclical process.

A linear gatekeeping model based on the theory of Galtung and Ruge (McQuail and Windhall, 1993) develops one aspect of gatekeeping, namely criteria that affect the rejection or selection process of world events or news. McQuail and Windhall provide nine factors of which sociocultural values and cultural proximity are but two factors. Applying this model to learning material could predict that the learners' culture could affect their acceptance of the messages is inappropriate visuals or text is incorporated into the material. Inappropriate cultural conventions in the learning material could, in terms of this model, lead to a rejection.

What is clear from the brief review of some of the communication models is that they have progressed from a simple model by Aristotle, a gatekeeping model where cultural values could lead to a rejection, to a more complex model with a visual literacy orientation by Pettersson. A combination of these models would produce an interacting model consisting of interrelated components that would relate to its environment as a whole and as individual components. It could point towards a complex communication model that is composed of several objects and smaller elements. An object in the context of this discussion is, for example, "the sender" or "the message" in a model. An element could be, for example, the "communication skills" of the sender and the "mood" of the receiver. Such a larger and more complex model would have several characteristics, namely relationships and interdependence between the components and the elements. The effectiveness of a message, for example, depends inter alia not only on the skills of the sender, but also on the ability of the receiver. The receiver is at the same time affected by his/her culture and by noise or interference in various places in the communication process.

A communication model whose function it is to present the phenomena of communication (within the scope of this workshop) in a systematic and comprehensible but simplified graphic format must represent an open system, and that such an open system must have an interactional approach.

## CULTURAL ASPECTS IN COMMUNICATION MATERIAL

The review above showed that communication, as depicted in structural models, consists of several components that relate to each other, and also showed that several elements in the communication process can affect the eventual outcome or aim of the communication process. A receiver's perception varies and is affected by several factors, one of these being the receiver's cultural and social status. This section provides a perspective on the integration of culture and communication and will focus on those factors that could have a potential negative or positive effect on the outcomes of picture-text learning material.

Green and Lascaris (1990), in a popular book "*Communication in the Third World*", written from a marketing and advertising perspective, aptly introduces their ideas by stating that " *you talk to people from a Third World base, not down to them*". Whilst it is debatable if there is a difference in the outcome of talking "*to*" a person or talking "*down to*" a person, the book provides useful guidelines for advertisers. The approach of Green and Lascaris appears to be written from a position of power, knowledge and experience in the marketplace. In contrast to this "top down" method of communicating, the position of Tomaselli and Tomaselli (1984) is more from a "bottom up" approach, whilst Linney (1995) advocates an even stronger "people-centred approach" where the target market is responsible for developing the communication material. In spite of Green and Lascaris's authoritarian perspective, they provide, as part of their ten guidelines to successful advertising, some broad guidelines pertinent to cultural aspects of communication. These guidelines are: focus on branding; use role-model endorsement; use the experience of sport and seek associations between brands and sport; use appropriate music norms; learn about camaraderie in metro and township scenes and use these emotional connotations; and use the educational environment as a marketing tool. What is significant about their pragmatic approach, is that these guidelines focus on sociocultural aspects of a particular target market, namely familiarity with visual items (branded goods, role models), experience (sport, music) and social activities (camaraderie). The underlying suggestion of Green and Lascaris is to take cognisance of sociocultural aspects of your target market and to use these cultural elements and social practices in advertising and marketing activities. This paradigm can hardly be regarded as significant, as it is a recognised approach advocated by researchers who work in related fields of communication, for example in health care (Holmes, 1964 and 1968; Linney, 1985; Hugo and Smit, 1998).

What is significant is that the value of sociocultural elements in communication with a commercial outcome, as suggested by Green and Lascaris, appears to be a recognised ingredient in an advertising campaign, both in local and international advertising activities. Suffice it to say that this approach and practice is evident in the mass media.

A guide for fieldworkers by Swanepoel and De Beer (1996), whose aim it is to introduce the subject of communication in development, lists several barriers to reception, understanding and acceptance. The publication also cites a set of rules on how to overcome communication barriers and practical "do's" and "don'ts" regarding communication. Cultural differences, in addition to social and political differences, are stated as factors that will create a barrier to the acceptance of a message during a communication process. This difference in culture as a barrier to communication is furthermore illustrated by Mbombo (1996) who, as an African medical doctor, cites several incidences where mixes of poverty, illiteracy and culture can create barriers to communication. A typical example is where illness is explained in terms of witchcraft or a "*tikoloshe*". Mbombo also explained that it would be inappropriate for a medical practitioner to ask "*What is wrong with you?*" and that *"What can I do for you?"* would be more appropriate since the medical practitioner is seen in the same light as a traditional healer, and is supposed to know what is wrong.

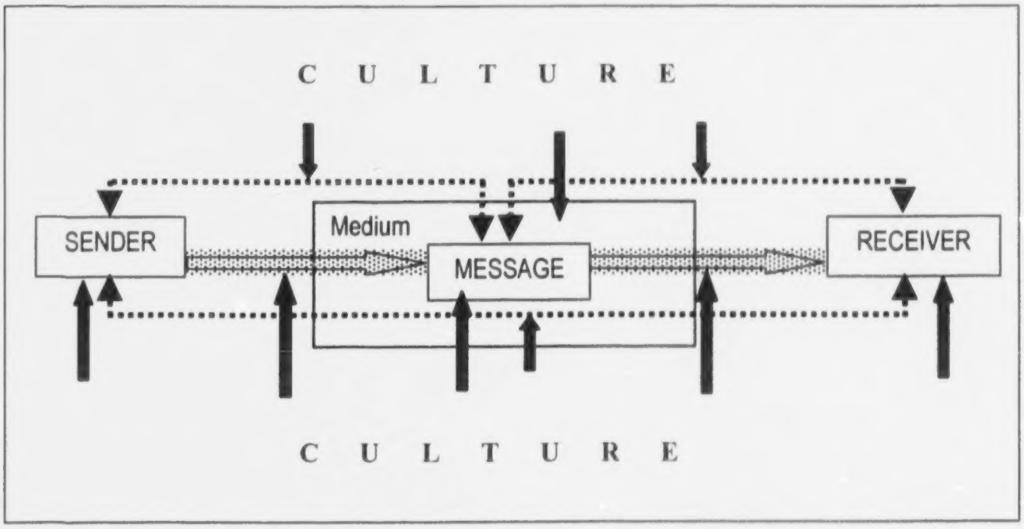
It is not only with communication-related aspects in the commercial, medical and social environment where conflict can arise due to cultural differences. Laws and moral precepts, signs of cultural identity similar to religious practices and language, embody the values and beliefs of the people that make up a particular group (Bennett, 1996). It is when people from different cultures meet, and when laws that govern one's group behaviour are in conflict with the other group's beliefs and practices, that difficulties will arise. Some examples are monogamous and polygamous marriage practices and the position of women in society when Western practices are compared with practices in some Middle East countries.

From the above it can be argued that culture in its widest sense is expressed and embodied in most facets of a person's life. Culture, expressed in laws and precepts, governs how an individual can or must behave within a particular society; it determines how marketers will approach an advertising campaign targeted at a specific group or how a medical doctor will communicate with his/her patient, to name but a few. The concepts of culture and communication are interwoven and regulate how people not only behave or express themselves, but also how they form a message and how another person responds to a message. This unison between culture and communication is described by Samovar and Porter (1995) as "*inseparable*", making it difficult to decide which is the "*voice*" and which is the "*echo*". Culture and communication are inseparable. The influence of culture could prove to be a major component in a structural communication model, and not a single influencing variable as depicted in Pettersson's 1987 model.

The preceding sections have shown that culture and communication are inseparably linked and that culture is a lens or a filter through which people receive, interpret and transmit messages. Communication is an open system and takes place within a cultural environment. This environment affects the sender, the receiver and the relationship between the sender and the receiver. This concept is graphically presented in Figure 4 as a picture-text-communication process that takes place within a cultural environment. The purpose of this model is to show the importance and position of culture in relation to the communication process.

**FIGURE 4**

A graphic representation of the communication process within a cultural environment.



The communication model operates within a cultural environment. The black arrows denote the specific positions in the communication process where cultural influences may occur. The broken arrows indicate the communication and feedback process. Culture acts as noise factor in a communication process and can interfere with the sender's ability to encode a message, it can interfere with the feedback process between the receiver and the sender and influence how the receiver interprets the message. Text, pictures and picture-text messages are subjected to cultural influences in the learning process where picture-text learning materials are used.

## REFERENCES

- Bennett, T.W., (1996). "Law as expression of culture". In *Cultural Synergy in South Africa*, ed. Steyn, M.E. and Motshabi, K.B., 77-88. Randburg: Knowledge Resources.
- Green, N., and Lascaris, R., (1990). *Communication in the Third World. Seizing advertising opportunities in the 1990s*. Cape Town: Tafelberg and Human & Rousseau.
- Holmes, A.C., (1964). *Health education in developing countries*. London: Thomas Nelson and Sons Ltd.
- Holmes, A.C., (1968). *Visual aids in nutrition education. A guide to their preparation and use*. 7th ed. Rome: Food and Agricultural Organisation of the United Nations.
- Hugo, J., and Smit, M., (1998). "Making media messages more suitable for health education in the Africa context". *Journal of Audiovisual Media in Medicine*, **21**(3):87-94.
- Laswell, H.D., (1948). "The structure and function of communication in society". In ***The communication of ideas***, ed. Bryson, L. New York: Harper.
- Linney, B., (1995). *Pictures, people and power*. London: MacMillan.
- Mbombo, O., (1996). "Practising medicine across cultures: Conceptions of health, communication and consulting practice". In *Cultural Synergy in South Africa*, ed. Steyn, M.E. and Motshabi, K.B., 109-117. Randburg: Knowledge Resources.
- McQuil, D. and Windahl, S., (1993). *Communication Models*. 2ed. London: Longman.

- Neuliep, J.W., (1996). *Communication Theory. Applications & Case Studies*. Needham Heights, Massachusetts: Allyn & Bacon.
- Pettersson, R., (1993). *Visual information.* 2nd ed. Englewood Cliffs, New Jersey: Educational Technology Publications.
- Samovar, L.A., and Porter, R.E., (1995). *Communication between Cultures.* 2nd ed. Belmont: Wadsworth.
- Shannon, C.E., and Weaver, W., (1949). *The Mathematical Theory of Communication.* Illinois: University of Illinois Press.
- Swanepoel, F., and De Beer, F., (1996). *Communication for Development. A Guide for Fieldworkers.* Halfway House: International Thomson Publishing (Southern Africa).
- Tomaselli, K.G., and Tomaselli, R., (1984). "Media graphics as an interventionist strategy". *Information Design Journal*, **4**(2):99-117.

TEND 2000

## Crossroads of the New Millennium

# Informational And Cultural Situation In Developing Countries

**Prepared and Presented**

**By**

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## Sunday 9 April, 2000

## Workshop 1

# Abstract

The cultural development of the modern East countries, including the Republic of Kazakhstan, is a complicated and contradictory process, where the common cultural ways were shaped differently and specifically in different countries. Nevertheless, the common historical fate influenced this development and gave these countries some common problems to solve.

There are traits of colonial rule in the cultures of eastern countries: lack of self-confidence, turning to the former rulers or "elder brothers" and the endless repetition of the well-known refrain. Of course, there is some progress and the post-colonial way of thinking is slowly and gradually replaced by new ideas.

One of the most important and distinct features of the modern world is the infinitely expanding ability of information suppliers. Information may serve now not for only communication and learning but also as a means of controlling the society. It can become the strongest weapon that allows some cultures to dominate others. The information determines the taste, views and behaviour of the consumer.

There is often a sense of prejudice or disrespect towards the people who live and think in another way. This sense can appear in news and reports without notice but it affects people very efficiently.

The info-cultural space is an area whose borders do not match geographical, political or economic borders of the modern world. The only possible limitations are the technical capabilities and low-level communication means. The info-cultural space is not only the sphere where the information and culture spread, but also the arena for meeting and interaction, sometimes peaceful and sometimes not, of different national traditions, ideas, values, types of art and ways of thinking; everything that is included in the term "national culture".

The idea of info-cultural space has come into our life recently with the development of satellite broadcasting, video dubbing and filling the market with the mass culture production. Of course, we are talking about the mass culture of the West and mainly the USA, who have all the necessary resources to invade the minds and souls of people, especially the young.

The info-cultural borders are very easily penetrable, as they are not protected by any laws and conventions. The aggression in this sphere exists also between the technically developed countries of the West, but they have a strong defense: their own mass media, rich literary traditions, well-financed cultural institutions.

As for the third world countries, one of their ways of defense is religion, especially in the most concentrated, aggressive form - traditionalism, fundamentalism, which offer to preserve the national religion traditions and dignity. Some legislative measures have already been taken in Kazakhstan which determine the 50% of national language broadcasting, but they are not enforced. Besides, their national security law prohibits foreign participation exceeding 20% in mass media. But also a great role must belong to the balance between the information sources in order to avoid the domination of the West. The mass media must help and spread different cultures and views, and not to serve as a weapon of the strongest.

Special measures must be taken to protect the national info-cultural space. They should be worked out by both government and non-governmental organisations and should be assisted as much as possible. Each country's distinct culture must be given all the opportunities to develop and flourish and this must be the scientifically developed common strategy for developing countries.

We do not vote for cultural isolation, but we think that the interaction must be equal and must only enrich cultures, leaving the choice of life to everyone.

# Informational and Cultural Situation in Developing Countries

The world has come through many changes in recent decades and one of them was the collapse of the USSR as a superpower, which signaled an end to the competition of two major political and ideological poles and the breakdown of the socialist bloc. These changes had an effect strong enough to speak about the shift to a New World outlook on its contemporary evolution stage. A whole period in our civilisation's history is completed and probably the world is now accepting a certain new system of communication and existence. And all the spheres of people's activity – politics, economics, ideology, culture - are going to be effected by these changes. What we are going to witness is an intense transformation of the human way of thinking, consciousness and intellect.

The cultural development of the modern East countries, including the Republic of Kazakhstan, is a complicated and contradictory process, where the common cultural ways were shaped differently and specifically in different countries. Nevertheless, the common historical fate influenced this development and gave these countries some common problems to solve.

The former immovable Soviet "monolith" has been replaced by a fragmented structure combining various components, some of which, including the Central Asian states (Kazakhstan, Kyrghyzstan, Uzbekistan, Tajikistan and Turkmenistan), tend to belong to the Southern side in the "North-South" resistance scheme. South – not in a geographical sense but an economical one, because unfortunately all these countries, during the previous 70 years, were used as a base for raw materials, the industry of which was exploited.

That's why all these states were closely connected to the centre and depended on it. It was also a big agricultural region and its production was of great importance for all the superpowers.

Only now we can realise how irrational this division was, because by interrupting economical links with other countries and mainly with Russia, many regional factories and plants closed down and unemployment escalated to high levels.

An unstable economy gives birth to an unstable society, unstable in all its spheres and, of course, culture.

Actually we had no time to be conscious of ourselves, of what we are, what kind of people we are, what our place in the changing world is, what our possibilities and our limits are.

When the euphoria of the newly-acquired sovereignty passed, in 1991, we suddenly realised that nothing changed, we were the same in our minds and in our souls. The same dependence on Russia existed, be it cultural, economical, or political. And for our dreams of independence to come true we need to rebuild ourselves, our mentality, our way of thinking.

There are still traits of communist rule in the cultures and ideology of Central Asian countries: lack of self-confidence, turning to the former rulers or "elder brothers" and the endless repeating of the well-known refrain and slogans. Of course, there is some progress now and the long-existing way of thinking is slowly and gradually being replaced by new ideas. But one of the most important things, which I wish you to know, is that when I say "Russia" I don't mean Russian people. Perhaps it would be better to say "Moscow" or "Kremlin" because we are not against Russia as a land. Our conflict hasn't any national or ethnic features. It deals with the contradiction between the old system, the communist party dictates and the new society, the new system of relations, the new ideas and ways of thinking.

Probably, Russian people have suffered from this historical experiment no less than others have but, speaking for my country, I must say there is no hatred towards Russia and Russian people. All of us were victims.

Besides that, the demographic situation is such that until 1998 the number of Russians in Kazakhstan was estimated at about 46%, while the number of Kazakhs, the original population, was about 42-43%. And in such a situation saying that one half the population hated or hates the other half is absolute nonsense.

Many of our professionals and academic staff were educated in Russia. They joined its culture, literature, language, and feel grateful for it. Even now, despite the active emigration process, the number of Russians staying in Kazakhstan approaches 40%. Many of them don't want to leave the country because they feel it is their motherland.

Returning from the demographic situation to the current informational and cultural situation, I should say that among the most important and distinct features of the modern world are the infinitely expanding abilities of information suppliers. Information may serve now not just for communication and learning but also as a means of controlling society. It can become the strongest weapon, which allows some cultures to dominate others. The information determines the taste, the views and the behaviour of the consumer.

There is often a sense of prejudice or disrespect towards the people who live and think in another way. This sense can appear in news and reports without notice but it affects people very efficiently.

The info-cultural space is an area whose borders do not match geographical, political or economic borders of the modern world. The only possible limitations are the technical capabilities and low-level communication means. The info-cultural space is not only the sphere where the information and culture spread, but also the arena for meeting and interaction, sometimes peaceful and sometimes not, of different national traditions, ideas, values, types of art and ways of thinking; everything that is included in the term "national culture".

I think it is possible to divide Central Asian states into two groups. The first, being a more closed type or closed society, in my opinion, consists of Uzbekistan, Tadjikistan, Turkmenistan. In terms of cultural attitude, these states, even during the Soviet period, were more conservative and traditional than others. They preserved religiousness, probably because the number of villagers was much more numerous than the urban population. Of course there are some other reasons, historical, geographical, for example. But I want to confess that formerly, this conservatism and traditionalism seemed to be a great shortcoming. Now, I am not so sure anymore.

The second group, in which I include Kazakhstan and Kirghizstan, is a group of open type societies, who are active in the acknowledgement of Russian or foreign cultures and information and unfortunately, as a result, lose rapidly their national identity and national culture. Therefore, being excessively open or being excessively closed – both of these situations are equally dangerous.

With the first group of states, taking into consideration their evident relation with the East, their spiritual, religious, geographical intimacy and close connections with Islamic states such as Iran, Afghanistan, Pakistan, it is possible in general to strengthen Islam, but in its most fundamentalist, aggressive form. (There were some events and incidents which support this opinion, for example attempts to kill Uzbek president, some military operations in Tadjikistan mountains and others).

Everybody has a right to make a choice of their own course of development, the only criteria is the well being of people. As for our country and Kirghizstan, we can observe a tendency towards relations with the North and West.

Of course I can't say that this division of Central Asian states is already fulfilled, not at all, there is only a potential tendency. But the informational and cultural situation in Kazakhstan today is very disturbing and there are reasons for us to be disturbed. Unfortunately, we have to state that for some Eastern countries, seeking to enter world civilisation, have effected their society's intellectual degradation by new information schemes and mass culture which allow them to manipulate society, and hence turn it into an obedient mass. Through worldwide mass media, their population is becoming subject to Western modernisation projects, ideas and value systems, which result in the destruction of the foundation of local traditional culture and irreversible change in national mentality. The "price" of accessing the achievements of modern technological civilisation is the impoverishment of humanity's cultural foundations. Objectively, the society shifting from the traditional to modern forms does not have to follow the Western patterns and view the Western culture as an ideal type. The society can be "modern" in terms of economics, science and technology without becoming westernised in cultural terms. Self-identity is not an ideology of anti-westerners and traditionalists, but a natural conviction in one's social and cultural significance, distinction and self-efficiency. The self-identity theory admits the necessity of modernisation, but with the preservation of a distinct culture. Self-identity means first of all defining the differences, distinctions, of what distinguishes one people from another, makes them special, particular, and original. Plunging into the depth of their own culture, history, language, and understanding and admitting those traditions and customs which don't hinder general progress, could be compared to vaccination during childhood, or receiving immunity to dangerous diseases.

The idea of info-cultural space has come into our life recently with the development of satellite broadcasting, video dubbing and filling the market with mass culture production. Of course, we are talking about the mass culture of the West and mainly the USA, who have all the necessary resources to invade the minds and souls of people, especially the young. Dialogue and interaction are replaced by the massive attack of technical media that can be compared to mass destruction weapons in terms of efficiency.

The info-cultural borders are very easily penetrable, as they are not protected by any laws or conventions. The aggression in this sphere exists also between the technically developed countries of the West, but they have a strong defense: their own mass media, rich literary traditions and well-financed cultural institutions.

As for developing countries, it would probably be an exaggeration to say that the consumer orientation, of Western kind, has conquered all of them. Traditional oriental values still hold strong in some countries of the Near and Far East, South and Central Asia, where we can observe the spontaneous or intentional combination of traditional and modern lifestyles; their organic synthesis. Although, only countries with strong religious and cultural foundations can oppose the destruction of local culture, probably, the most successful example of transformation of an oriental society under Western influence is Japan, though it is not developing but a developed country. The state here provides and guarantees the effectiveness of all structures and elements. Japan became a capitalist country like Europe, but it remained Japan. Having outstripped European countries in many spheres, it remained an oriental country. Obviously, those traditions hindering the transformation of the society were changed and the others remained the same.

As for Kazakhstan, unfortunately we have to say that it does not have that strong religious and cultural foundation as in the countries of the Far East. As early as during the Soviet period, our republic's distinctive feature was its easy reaction to any external influence and readiness to become subject to any of Moscow's experiments, such as destruction of pastures in order to provide the whole country with grain or using the country's territory as a place of exile for criminals or whole nations in the period of repression, creation of military and aerospace bases, nuclear tests etc. Qualities of Kazakh national character, such as gentleness and trustfulness and the fact that other nationalities began to outnumber them, led to the replacement of the Kazakh language by Russian, national traditions were almost gone, and the religiousness of the people was not significant even before 1917. Official culture was regulated, unified, typically "Soviet", although some national elements continued to exist (some crafts, folksongs, poetry).

With independence, it seemed the situation would change. The party dictate and censoring disappeared. There was an opportunity to reconstruct the history, the national legacy, which was almost lost. At the same time the authorities, including the President declared Kazakh's intention to enter the world community, build a democratic society similar to Europe, and redefine the country's place on the world's geopolitical map.

Currently, the country is experiencing great problems economically; it has to rebuild everything from scratch. But, I think, the situation in the spheres of culture and ideology is even more serious. There is a vacuum that is now being filled with a fantastic mixture of oriental religious elements and western technological culture, pirate videos of the lowest quality and the ideals of material welfare as a life's goal, search for the National Ideal and readiness to sell national property… The national culture couldn't even get up on its feet, when it was "knocked down" by the technically overwhelming Western ideological, informational and cultural machine.

Some legislative measures have already been taken in Kazakhstan which determine 50% of national language for broadcasting, but they are not enforced. Besides, their national security law prohibits foreign participation exceeding 20% in mass media. But there are a great number of cable TV channels with non-controlled programmes, which are available almost with every family. The mass media must help and spread different cultures and views, but not serve the strongest.

Special measures must be taken to protect the national info-cultural space. They should be worked out by both government and non-governmental organisations and should be assisted as much as possible. Each country's distinct culture must be given all the opportunities to develop and flourish and this must be the scientifically developed common strategy for developing countries.

We do not vote for cultural isolation, but we think that the interaction must be equal and must only enrich cultures, leaving the choice of life to everyone.

TEND 2000

## Crossroads of the New Millennium

# Economic Education, Executive Education, And The Training Of Commercial Diplomats For The Global Economy

Prepared and Presented

By

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Sunday 9 April, 2000

## Workshop 1

# Abstract

The importance of international trade and investment to the achievement of economic diversification objectives has increased the need for professionals skilled in trade policy development and negotiation, a field that has come to be referred to as commercial diplomacy. There is a severe shortage of such professionals in developing countries, which limits their abilities to take full advantage of the opportunities offered by international trade and investment, and the globalisation of the world economy. It is proposed here that development of executive education programmes, focused on building a network centres for commercial diplomacy, will help alleviate this problem in the UAE.

# Economic Education, Executive Education, and the Training of Commercial Diplomats for the Global Economy

As His Excellency Sheikh Nahayan Mabarak Al Nahayan aptly acknowledges in his introduction of the brochure for this conference, the role of education in the process of national development is a vital issue for developing and developed countries alike. He is wise to state that this is 'a time both of retrospection and or anticipation throughout the world.' It is also a time of 'anxiousness,' especially on the part of developing countries who, on the one hand, eagerly anticipate receiving the benefits of participating more fully in the multilateral trading system (MTS), but who, on the other, are anxious about there abilities to operate effectively in this system. As UN Secretary General Kofi Annan said at UNCTAD X "the main losers in today's very unequal world are not those who are too much exposed to globalisation. They are those who have been left out."

A key reason for this anxiousness is that there is not sufficient numbers of the types of executive education systems that can train expert commercial diplomats and/or private sector negotiators in the requisite numbers needed for effective participation in the multilateral trading system. As His Excellency has printed out through his convening of this conference, we indeed sit at the Crossroads to a New Millennium wherein the 'entrepot of trade, ideas and people' are the backbone of any country's ability to achieve integration into the global economy. Mainstreaming trade into education strategies aimed at raising peoples' capacities and broadening their ideals is of critical importance. The best way to combine these agendas is by introducing executive education programmes aimed at building a world class core of commercial diplomats who can represent both ministries and firms in international trade fora. This lecture will show how such programmes could work within systems like the Higher Colleges of Technology.

## BACKGROUND

The importance of international trade and investment to achieving economic diversification has increased the need for professionals skilled in trade policy development and negotiation, a field that has come to be referred to as commercial diplomacy. There is a severe shortage of such professionals in developing countries, which limits their abilities to take full advantage of the opportunities offered by the emerging multilateral trading system, and the globalisation of the world economy.

The field is broad. Training in commercial diplomacy is needed for officials responsible for the international economic policies of their countries, executives responsible for managing relations with foreign governments, and all others with a commercial or policy stake in international trade and investment. Stakeholders should be familiar with the multilateral trading system's rules, institutional processes, and standards, but this is not enough. Stakeholders must also acquire the skills necessary to develop appropriate trade and development policies, to design effective negotiating positions, to writing effective export strategies, and countries must invest in the human capacities, institutions, and the services infrastructures require for attracting foreign investment. Technical assistance in institutional strengthening and the need for enhanced capacity building have become core issues in international negotiations on trade-related issues, especially at the World Trade Organisation (WTO). Recognising that there is a shortage of trained trade professionals helps to explain the tremendous gap in perceptions between developing and developed countries about whether or not the body of trade rules that is emerging from the WTO support the economic interests of developing countries.

Most international trade organisations and many national economic assistance agencies have developed training programmes that attempt to fill the gap in trained trade professionals. These programmes typically consist of short-term workshops held in developing countries or of seminars held in Geneva or Washington. The obvious problem with this approach is that it will not enable countries to train the critical mass of government officials, facilities managers, firm executives and services professionals that are needed for effective participation in international economic policy process. Such programmes do not offer sustained training efforts or support long-term learning or development of real professional competence, and the training materials used rarely contain sufficient local context or case studies that can be used in the home country.

What is required is the development of networks of regional and national training centres that can reach a full range of practicing professionals who have a stake in international trade and investment. Such training centres should be largely staffed by local experts and only supplemented by foreign experts. They should have access to generic training materials reflecting global best practices. They should also have the means to develop materials customised for the particular trade interests, laws, institutions, cultural values and practices of the regions or countries involved.

## THE CHALLENGE: ESTABLISHING REGIONAL AND NATIONAL TRAINING NETWORKS

Training in what is now referred to as Commercial Diplomacy is a relatively recent development. The first comprehensive graduate programme leading to a Masters of Arts in Commercial Diplomacy (MACD) was developed in 1995 at the Monterey Institute of International Studies in Monterey, California. A few other graduate schools have added individual courses on trade policy and several MBA programmes now offer courses in negotiating skills, but few of these are diplomacy specific, and even fewer have any focus on developing countries.

Moreover, virtually no training manuals, textbooks or other teaching materials that are customised so that they properly reflect regional circumstances and/or discussion of developing countries' trade interests. Therefore, efforts to design and implement sustainable commercial diplomacy training programmes must include focus on developing world class training materials - including teacher's manuals, text books, case studies, and other instructional materials. This means that train-the-trainers components as well as train-the-writers components must be included in these courses, and also inclusion of distance learning approaches.

It is not enough for a host country organisation to organise seminars, workshops, or short courses presented by experts from the developed world. In contrast to this popular albeit ineffective approach, a more appropriate goal is to build sustainable indigenous programmes that can offer commercial diplomacy training to a broad array of stakeholders in a country's trade policies. This requires the development of networks of both regional and national training centres staffed by local experts. These experts will have to participate themselves in capacity building exercises, and they should be trained to provide the kind of hands-on training that is required in this field (preferably they should have field experience). From the beginning, these experts should have access to generic training materials that reflect global best practices as well as guidance in how to design and teach through the use of negotiations simulation sessions.

By extension, these experts should also have the means to develop materials that reflect local trade policy and negotiating interests, laws, institutions, cultural values and practices of the regions or countries involved. Foreign experts can usefully supplement local instructors, but should not provide the core of such instruction. Instructors for training in commercial diplomacy could come from practitioners in both the government and the private sector that are found in every capital, as well as from university faculty members who have had some experience in working with international organisations and/or their own government on trade issues. Another source of local instructors could be found in the foreign embassies of countries with well-developed expertise in this area. The bulk of such instructors could serve as adjunct faculty. The permanent staff required to run such a programme could be relatively modest, meaning a core staff of 5 to 10 administrators and full-time instructors and adjunct faculty. The key to making such a low budget approach work is the development of a kit of course outlines, teaching materials, distance learning resources, and teachers manuals, combined with programmes to train the trainers. An initial set of training materials is available from the International Commercial Diplomacy Project web site, commercial diplomacy.org. In addition, once a central Commercial Diplomacy Institute is establish, the staff from this centre can serve as resources for helping establish satellite programmes, e.g. at branch campuses for HCT or at affiliated offices for organisations such as the Federation of Chambers of Commerce. With USAID's support, such pilot projects for commercial diplomacy training are currently being established in Sri Lanka, Thailand and East Africa. It is envisioned that promising individuals from these programmes will be sponsored by their host countries for further studies in graduate programme like the Masters of Arts in Commercial Diplomacy at the Monterey Institute for International Studies. Because it the facilities in the UAE and its neighboring states are strong, it is easy to imagine that a commercial diplomacy programme could be implemented at an institution like the HCT.

## THE CONTENT OF A COMPREHENSIVE COMMERCIAL DIPLOMACY TRAINING PROGRAMME

A comprehensive training programme in commercial diplomacy calls for courses in many different disciplines - economics, business, politics, law, media and public relations, international relations, negotiation and dispute settlement, area studies, foreign languages and culture. An ideal programme would be structured as a sequence of four distinct stages of instruction – theory, institutions, techniques and skills, and integration -- which are described in more detail below. Such a sequence provides a natural progression in the learning process. Students' knowledge of trade becomes deeper, and not just broader, as they progress through the programme.

The four stages of the learning process are:

## THEORY

Courses on theory should provide the intellectual and conceptual foundation for the field of commercial diplomacy. This introductory phase of the programme should include a heavy dose of economics, as well as courses in politics and policy analysis.

## INSTITUTIONS

Courses in the second phase of training should introduce the institutional context of trade and trade policy. Courses would cover international and national trade organisations, regional trading arrangements, and international trade law. Other courses could cover the history of thought on trade, the history and evolution of trade policy, in-depth analyses of case law and international institutions.

Skills and Techniques: In the third phase of training, students are in a position to combine their knowledge of economics, politics, law, institutions, media and culture into a coherent analysis of international commercial issues, and to develop an integrated strategy for advancing policy prescriptions desired by particular stakeholders. Students learn how to advance the commercial interests of their country or organisation through the effective use of advocacy tools such as hearings, press conferences, coalition building efforts and negotiations. They learn how to write effective operational documents such as policy papers, briefing memoranda, negotiating instructions, reporting cables, press releases, testimony, opinion editorial pieces, and public relations speeches. Students learn to combine the disparate subjects previously covered in ways that will enable them to function effectively in the private and public practice of commercial diplomacy. Courses could include: courses on framing of trade issues; the art of politics; relations with press, public and legislative bodies; and negotiation tactics and skills. Application in a Real World Environment: In the fourth phase of training, students learn how to apply everything they have leaned to current real world issues. They also learn how to develop effective operational strategies for advancing the interests of their country or organisation through public advocacy tools, negotiation and dispute settlement. This phase of training could include courses in which students participate in simulated trade negotiations, courses involving studies of current cases, and courses that give students the opportunity to examine a particular issue in depth and to prepare an effective negotiating strategy.

## TRAINING MATERIAL REQUIRED FOR EFFECTIVE TRAINING IN COMMERCIAL DIPLOMACY

Implementation of an effective training programme in commercial diplomacy requires the development of a variety of training materials. It requires the development of instructional modules, teacher's manuals and eventually text books for many of the courses listed above that are not part of the standard curriculum of university programmes in economics, politics, law or public relations. It also requires the development of case studies, negotiating simulations and guides to the preparation of effective operational documents such as briefing memoranda, strategy papers, negotiating instructions, white papers, press releases and other public advocacy documents. The case study approach, like that used in Harvard's Executive Training programmes, is effective in teaching the operational aspects of commercial diplomacy. Trade case studies are built around historically important or particularly interesting trade problems and demonstrate how they were addressed through advocacy programmes, legislation, negotiations or dispute settlement. They provide insights into the political and economic strategies that were employed by industry advocates, politicians and government officials. Furthermore, they give both students and professionals a way to learn from past successes and mistakes. Case studies afford the critical opportunity for seasoned trade negotiations to illustrate what went well, what didn't, and what could have been done to improve their position? Simulations provide an opportunity for students to practice negotiation, mediation, dispute settlement and public advocacy skills while addressing real world issues in commercial diplomacy. Unlike case studies, which are historical, the simulations are drawn from real-world situations on current outstanding issues. Simulations provide a nuts-and-bolts perspective that is an excellent way to train trade professionals, and they teach students how to integrate material from disparate business, economics, politics, law, culture, public policy and science into a strategy; how to simplify and focus complex issues to the priority issues; and how to make decisions in the face of imperfect information and the time pressures typical of the real world. Simulations teach not only the art of negotiation, dispute settlement and public advocacy, but also how to use research to pull together information relevant to these processes.

## DEVELOPMENT OF A DISTANCE LEARNING NETWORK

Distance learning resources should be an important component of any comprehensive effort to help developing countries to build an institutional training capacity in commercial diplomacy. Several such initiatives have been launched, and in combination could provide an important foundation for the development of an effective network of distance learning resources. Therefore, when establishing a centre for commercial diplomacy the host institution should consider participating in the World Bank's Global Distance Learning Network, which utilises World Bank facilities around the world to deliver instructional materials developed by the World Bank Institute. The World Bank is also working with partners in other divisions of the Bank and outside organisations to develop additional courses, such as the International Trade Centre in Geneva, which is a UNCTAD-WTO joint venture for technical assistance. Another initiative in this area has been organised by the International Training Centre of the State University of California at San Diego (SUCSD), which broadcasts monthly programmes to over 150 sites in Latin America. These broadcasts have included an annual live broadcast on different aspects of commercial diplomacy.

A third distance learning resource is provided by the International Commercial Diplomacy Project's web site, commercialdiplomacy.org, which makes training materials in commercial diplomacy available on line. It includes a model structure for training in this area, course outlines, instructional modules, case studies, negotiations and dispute settlement simulations, sample documents, and a guide to available internet resources.

## INTERNATIONAL COORDINATION

It is also desirable in commercial diplomacy training to coordinate the efforts of the various international trade agencies, multilateral organisations, national economic development assistance agencies and private institutions working in this area. A possible way to initiate a commercial diplomacy programme would be to hold a workshop for local professionals active in this area and experts at multilateral institutions who have developed specialised materials. The goal of this workshop would be to bring people together in order to present and review materials that could be used at a national Centre. Such a workshop could be organised in either Geneva at a multilateral institution such as the ITC, at an academic institution such at the Monterey Institute for International Studies, or at the host country institution that is looking to establish a training centre, Abu Dhabi; Chamber. The proposed workshop would be organised around an initial set of presentations by the various international organisations and private educational institutions with programmes in the area. The presentations would cover the training materials each organisation has developed, the educational philosophy underlying these materials, how these materials have been used, and current plans for the development of additional materials. The second part of the workshop would be devoted to a needs assessment and the development of an "ideal" curriculum and set of supporting training materials. A third part of the workshop would focus on a review of current training programmes in developing countries, and on current and potential initiatives to create a sustainable local institutional training capacity in developing countries. This discussion could be organised around a review of current initiatives by the various organisations and an evaluation of past successes and failures in establishing locally sustainable training institutions in the area. The final session of the workshop would be devoted to a discussion of options for expanding the resources available for the development of training materials in the area, and for the establishment of locally sustainable training programmes.

## CONCLUSION

In order to train a generation of effective trade policy makers and negotiators in a country like the UAE, it will be necessary to establish a network of training programmes in commercial diplomacy in key cities, and to establish a regional centre in the capital city, which could be used by people across the GCC. Because of its branch network and campus structure, the HCT could play a key catalytic role in making such an effort a success. However, it must first make a commitment to offer trade-related executive education.

TEND 2000

# Crossroads of the New Millennium

## Tapping A Potential For The Good Of All

Prepared and Presented

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**Workshop 2**

# Abstract

In this paper I explore some of the ambiguities in educational policies in Jordan, Syria and Sweden.

The Middle East and Sweden obviously differ in history and educational policies and traditions. Sweden has a long tradition of mandatory schooling, while in the Middle East the tremendous expansion of schooling and higher education is more recent. But there are similarities too. Education, including higher education, is universally seen by state agencies as a means to develop both the nation and the individuals of the nation. Higher education is thought to bring about development and to be an instrument for development. To be educated is both a right and a duty. The relationship between these aspects is seldom scrutinised. Education today is under pressure to bring about and support national development, yet the political economy of higher education is one of global competition. Issues of gender and higher education policies show both similarities and differences between the countries. Higher education is facing many difficulties today. Overcrowded universities, financial constraints and uncertain career opportunities are especially felt in Jordan and Syria. The prestige of a university education is still of importance, however, especially in the Middle East. The future is, however, very uncertain.

# Tapping a Potential for the Good of All

*"In the name of God, the Merciful, the Compassionate"*

***"We had the best nation on earth and our science was the mightiest, and then there passed a current over the Arab homeland which influenced our knowledge and we fell back a lot, and then we wanted to rediscover our development and win back our earlier glory and in this way our activities and our thoughts always go forward. And I am in the middle of this sea longing for progress. I dream to realise my country's progress and development and I hope to become a doctor to serve my country and its sons and daughters, rather than having to rely on foreign doctors. I want everything good for my country in the future because the progress and civilisation and greatness we used to have is a guide for how good and struggling our children are. I hope that my country develops scientifically and that knowledge spreads and that the economic situation becomes improved and that there will be more buildings and that the country will become more beautiful. In my dreams I have painted this picture and I believe in it. We are Arabs, here eternally. Like the sun setting in the east, this is our country and we dream of the day our past inheritance from our forefathers shall be returned and the country once again will stand up"***

This quote is an essay written by a young Jordanian woman in her last year of secondary school. In 1988 and 1989 I did fieldwork in Jordan and Syria asking about 500 12th grade pupils to write about their future hopes and aspirations for themselves and for their country[i]. The essays depict enormous educational aspirations on the part of the pupils, as well as hopes for great national progress and development. Furthermore the pupils link their own educational success to the development of their country. By becoming a scientist, a doctor, an engineer, a pilot or a pharmacist they will help bring about development. At the same time national development will provide more opportunities in higher education for young people. These very interesting essays reflect an almost globally accepted relationship: that between formal education and development. Formal mass education, primary, secondary and tertiary, forms a very special relationship to a discourse of national development. At the same time it is also a phenomenon which is thought both to increase globalisation and to constitute one of its characteristics. Formal mass education is first of all generally seen as a (n end) result of development. Through development more and more formal education will be spread to a population. Secondly formal education is also seen as an indicator of development. Countries are weighed and measured on a development scale by looking at the spread of formal education on primary, secondary and tertiary levels. Mass education is hence evaluated on a global scale, and the perceived success or failure of education is used as an indicator of national ranking on a global scale. Thirdly education is also seen as an instrument to reach development. By making a population literate, by teaching certain skills, it is assumed that development will follow. The more formally educated the citizens of a nation, the more developed the nation.

Education and development constitute an enormous sub-field of scholarly (and public) interest[ii]. Modern mass education has for a long time been almost equated with development as such. Looking at the history of Europe and the USA we are told that there is a "close relationship between social progress and educational development"(Berend, 1985:31). It is generally accepted that literacy and formal education is a prerequisite for economic development. In order to "have" development, human resources have to be developed through the achievement of skills like reading, writing and arithmetic. All over the world there is a praise of education and political leaders universally extol its virtues. In fact, the perceived blessings of modern mass education are perhaps the only common denominator in world politics. Most political leaders, regardless of political or economic ideology, laud education. All over the world there is a great concern about the level of education, and about its content and form. International statistics focus on education as one indicator of development. International agencies and organisations are devoted to the spread, advancement and comparison of educational systems. Education is serious business indeed; deemed both as an almost inalienable human right and as a human obligation.

Being such an important business education- like development in general – is under constant scrutiny and evaluation in order to make "it" better, more efficient, less costly, more spread and better tuned to the demands of society. Just as formal education as such is lauded "it" is, at regular intervals considered to be in a crisis. Critical voices are just as prevalent as the generally positive view of education. Schools, it is said, do not form equally informed and knowledgeable citizens. Some critics claim that formal education is an instrument to discipline the dominated classes into submission. Others stress that there is very little relation between what pupils are taught in school and the skills they eventually develop to make careers outside school[iii]. But education, like development, has become a discourse so compelling that it is almost totally impossible to step away and question its semantic rules. Husén, a major expert on comparative education, sees the "soaring social demand for formal education" (1985:32) in the Third World as a major global problem. He expresses it as the *revolution of rising expectations.*

## EDUCATION, DEVELOPMENT AND THE NATION STATE

Historically the spread of universal formal mass education in the West is closely linked to the emergence of nation-states. This is also true of the Third World[iv]. One of the salient features of any given modern state is a national educational system and an army. Even in countries with a fair number of private educational institutions, it is commonly the state, which assumes responsibility for educational planning. The link between the state (or similar) structures and mass education is today so strong and obvious that we accept it without a thought. Gellner sees "modern education" as a mode of production (1989:29). The definition of the modern state, he argues, is that agency which has the "monopoly of legitimate education" (ibid: 34). This aspect can be added to the classical Weberian definition where the state is that agency which has a monopoly on legitimate violence. I would also argue that monopoly on legitimate development planning is an equally important aspect for, at least Third World, states. Looked at slightly different, legitimate violence, development planning and education are closely related in today's world. I argue that formal education is very important in most development plans and that education can be regarded as a symbolic and highly effective form of violence, entailing the disciplining of individuals for a higher purpose.

We can also look at education from another perspective. It is remarkable, according to some scholars, that mass education - despite the great variation of political systems– is so similar and "homogeneous in aspiration throughout the world" (Boli et al 1985:108). Mass education rests on the individual as the central unit, and its is "surprising how consistently educational systems attempt to build collective society by enhancing individual development" (ibid:109). In other words: formal schooling and mass education arose as part of whole new institutional frameworks between society and the members of society. Children were prised out of their kin-groups and families. They were put into schools to learn to become loyal individual members of (new) collectivities. Boli (1989:41) claims that modern mass education is a "ritual construction of modern citizens"[v]. Those lacking formal education are regarded as "an anomaly, a violation against the moral order" (ibid). This highly moral aspect of education is prevalent also in the Third World. A person cannot be modern- and developed – if she or he has not been to school. The school is the single most important means to become modern. Meyer (1989:xvi) argues that the salient feature of education, as we see it today, is that it reflects a model of society in which each individual citizen has both rights and obligations. I contend that citizens, including children, are seen as a potential to be tapped for the development of the nation as well as its individual members. It rather curious that so little intellectual effort has been put into analysing the supposedly causal relationship between individual education and collective or national (and today also global) development. Adam Smith stated firmly that the individual pursuit of wealth would lead to more wealthy nations. Socialist thinkers rather claimed that the individual could not pursue happiness and fulfillment outside collectivities. Today such bland assumptions are not very fruitful. The conceptual understanding of an individual clearly depends on how an "individual" is viewed against a background of "society". The common contemporary understanding of the individual cannot be prised out of the social and collective context. In a world perceived by many as global, with shifting borders and boundaries, and with multiple and contextually anchored identities, these concepts and their mutual interdependencies begs for closer analyses.

## EDUCATION AND DEVELOPMENT IN JORDAN AND SYRIA

International comparative statistics show that the Middle East/Arab World as a whole for decades lagged behind other regions in implementing universal mass education. There are, however, great variations from country to country. Some Westerners claim that "Islamic values" have blocked the expansion of secular mass education or that Islam, as a religion is not compatible with a modern school system. This argument is historically invalid and never contextually substantiated. Also in the Middle East modern mass education is linked with the emergence of the nation-state. Everywhere modern science and technology is seen to be needed and everywhere these are taught within a formal educational system.

In Syria education has expanded tremendously both in scope and in scale under Ba'th party rule. Education is free of charge and mandatory for six years, but most children finish the intermediate nine-year school. Schools are found everywhere in the country. Literacy, especially female literacy has increased dramatically. But all is not well, as witnessed by debates in Syrian newspapers in 1988 during a conference for the Teachers' Union. There were reports that dropout rates, even in primary school were alarmingly high in some regions of the country. The authorities were urged to take serious measures to amend the female dropout rate. In 1990 almost 2.5 million pupils attended primary school, an increase of a million and a half in twenty years[vi]. The population increase in this period was from 6.5 million to 12 million. In the same period the number of pupils in the intermediate level doubled. The most dramatic increase, however, seems to be among secondary school students; from 80 000 to 214 000. In 1990 there were 90 000 primary teachers and more than half were women. The rate of female teachers in the intermediate and secondary schools has steadily increased and by 1991 almost half were women. But less than half of the pupils in the secondary schools were girls in 1991. From official statistics we can see a clear urban bias in female recruitment, especially in the intermediate level. Obviously girls are sorted out of the educational system quite early, but those who do continue the intermediary stage have a higher rate of continuation in secondary school compared to the average boy. Syrian statistics lend themselves very easily to a rural/urban boy/girl comparison, which is not the case of Jordanian abstracts. But on the whole there are very few urban/rural and sex differences in the Jordanian school enrollment. People I interviewed in the Syrian Ministry of Education saw areas with low enrollment and high dropout rates as "tribal" or "feudal" or simply "backward". Employees in the Jordanian ministry never expressed such views. In Syria the state should extend education to combat these perceived evils. When education gets no firm grip, the social evils can explain educational failures.

The importance of education in Jordan can be shown by the simple fact that out of around 4 million inhabitants in 1991, almost 2 million were pupils (1-12 grades)[vii]. Also in Syria "pupils" constitute the single largest "occupational category", but the ratio is not as massive as in Jordan, but rather only about one fourth of the population (the same approximate rate as in Sweden). In Jordan teachers and school administrators constitute the largest group of public employees. In Jordan the vast majority of teachers are female until the secondary school. Education in both Jordan and Syria involves an enormous amount of people. In Jordan it can be said to constitute the core activity of the state. If we add post-secondary education (about 35 000 enrolled in the early 1990s) and university education (about 25 000 students in Jordan 60 000 abroad /sic!/ in the early 1990s) and the perhaps 2 000 staff, the sheer massiveness of education is shown very starkly.

*"I would like to study engineering in Syria, at Damascus University, especially architecture, because through this I can develop. I am very fond of drawing, and through this work I can raise the homeland in different ways, and in this way realise what is needed in the society I live. And concerning my country Syria, I want it to be civilised as well as in ways of building and I want to take part in these. I want my country to reach the highest levels of developed science, like electronics. And development cannot be reached without the consciousness of the individuals and their consciousness of the value of their homeland and Syria is very*

*important to me because first and last it is my country. And a person is not good if he does not give to his family and his homeland and knowledge raises the level of the homeland and also the economic situation helping to serve human beings peacefully.*"

In this essay by a young man in a Damascus school we can see the perceived link between individual education and advancement and that of the country. A great majority of the pupils in the science branch in both Syria and Jordan express a wish, in the essays, to become medical doctors, engineers, dentists, pharmacists or scientists. A great many worry that their grades are not sufficient, or that unfair entrance practices block their entry to the desired field of study. Pupils in the literary branches also express "advanced" career aspirations. They also see their own personal educational plans in terms of giving to their country, and helping their nation to develop.

Contrary to common Western stereotypes there is no gender differences concerning stated aspirations. The Syrian and the Jordanian girls express the same wishes, as do the boys.

***"In the name of God, the merciful, the Compassionate. The future…this word as I have thought about it, and I have thought much about, and we find that behind the word there are many unknown things. A human being will naturally draw up plans for the future. I, for example, am a female student in my last year and I work to get admittance to the university. How are our thoughts directed towards this? Many of us dream about university and higher studies. I want to study pharmacy at the University of Jordan and I would like to be a doctor at the Faculty of Pharmacy or Dean of this College. Sometimes you can realise your dreams but most of the time you cannot, and you will not study what you had planned, depending on many circumstances…."***

A young woman in Damascus writes:

……" *Since I have been a pupil I have always though about serving my Homeland and to increase its level and civilisation to the highest levels…..Since I was a child I wanted to study electronics or architecture and I have planned to really study to obtain these goals……*"

Another one writes:

……."*I want to become a civil engineer in the future and my road to this goal is through steady hard work. Work is what develops society……..*"

Another Jordanian girl writes:

……" *My aspiration for the future is first and foremost to manage my studies for my exams and then attend university if I have sufficient grades. I want to study electronic engineering* *and then start to work, since work is a holy message, and then I want to continue with a M. Sc. and after that I want to do a Ph. D..........."*

One must clearly not see these essays as simple career plans. Most pupils know that they are unable to fulfill these ambitious dreams. Neither are the stated ambitions necessarily what these young adults "really" would like to do. The essays reflect, to a certain extent, what they have been taught to see, both at home and in society at large, as desired and desirable goals, for the nation and for the individual. Furthermore these essays were written directly to me, a foreign European researcher and in that sense directed to an outside audience. Many of the pupils were probably also keen to counteract what they perceive to be a Western stereotype of Arabs as ignorant and uneducated. This perceived stereotype is at least commonly brought out in the essays. The pupils unanimously stress their duty towards the development of the nation.

**EDUCATION AND DEVELOPMENT IN SWEDEN**

In Sweden I made a small study to complement my Jordanian and Syrian material. The essays written by the Swedish pupils were very different from the Middle Eastern. None of the pupils seemed to have any particular national aspiration. Few had any clear plan for their own educational career. On the other hand the Swedish pupils wrote much more about their personal and emotional development including marriage and children. Such issues were conspicuously absent from the Jordanian and Syrian essays[viii]. Like the Middle Eastern material there were no marked gender differences in Sweden. The Swedish essays might reflect the more unproblematic attitude pupils have towards higher education and national development. They probably feel that they have plenty of time before making educational choices, and they are perhaps also awed by the enormous variation in the supply of higher education. And probably, finally, they have little faith or hope in their own ability to contribute towards national development.

Educators, pupils, students and planners in the Arab world hence grapple with more problems than their counterparts in, for example, Sweden. But these issues aside the Middle Eastern essays do reflect the notion that individual educational advancement is a prerequisite for the development of the nation. In my Swedish essays pupils expressed singularly self-fulfillment ideas. In Sweden policy-makers, politicians and not least people in higher education constantly stress that more (higher) education is a prerequisite for the continued success of the Swedish economy, or rather today, for the exit from the economic slump of the last decade. High unemployment rates have plagued Sweden in the last ten years, undermining faith in the welfare state, in politicians, and in traditional politics[ix]. Public spending on education, and especially higher education, continued between 1985 and 1995 when spending in the public sector was severely cut back. Education, especially adult continuous education and higher education, was uncritically perceived to be an investment for the future. The claimed shift from an industrial to an information society/economy had to be prepared by re-educating the population. In the last decade the role of higher education as part of citizens' self-fulfillment or as part of the civic "*Bildung*" tradition has not been stressed in official discourse[x]. Instead the development of science and technology is greatly stressed as the almost only road to both individual and national development. Although Swedish policymakers and educationalists have great means at their disposal in disseminating their view of the future and the role of the young generation, they also compete with many other sources of information in catching the attention of the citizens. In the Middle East policy-makers have fewer avenues to reach citizens but compete with fewer contradictory voices.

## CONSTRAINTS IN EDUCATION

It is often assumed that mass education in the West spread in the period of urbanisation and industrialisation. But this is not, in general, true. In Europe, Japan and North America mass education and practically universal literacy preceded industrialisation and urbanisation (Boli et al 1985:113). Husén claims that one cannot compare the spread of mass education in the West with the spread in the Third World of the last decades. He is critical of the way education has been "sold to the Third World as an instrument to bring about development and economic take-off (Husén 1985:32) and points to a number of important issues. In the West costs for education are sometimes criticised. But we should remember that in any given Third world country the educational costs proportionally swallow much more of the public budget. In most Third World countries education even up to the tertiary level is often free of charge. According to Husén "meritocratic ideas have become very important for Third world careers" (ibid). This feeds into the revolution of rising expectations, as more and more young people spend more and more time in schools and in institutions of higher learning. A dramatically increasing number of young people become highly educated but have fewer opportunities to get the kinds of jobs they expect, they want and feel they deserve.

This revolution of rising expectations is typical of countries like Jordan and Syria. My essays show that not only do pupils have great educational ambitions, they are also educationally geared towards specific paths into higher education. Both Syria and Jordan have, since the end of the 1980's tried to steer secondary school pupils from the science and literary branches into industrial and commerce branches as well as vocational schools. Educational planners realise those not only medical doctors but nurses and medical technicians are needed. But authorities have not been so successful in this endeavor despite the increasing difficulties, both in Jordan and in Syria, in gaining access to the prestigious colleges of medicine, pharmacy and engineering. Despite the commonly recognised difficulties in entry, the difficulties of completion and the increasing difficulties in finding jobs even for doctors and engineers, students still flock at the gates of these prestigious colleges. In Jordan more and more private colleges are opening to cater to national and regional students. In Jordan education has become perhaps the most important economic sector of the country. Yet employment seldom matches the formal education of the young generation.

In Syria, where I recently completed a year long fieldwork in Aleppo, educational and employment policies have drastically changed in the last decade. Before all university graduates were guaranteed – and were obliged for certain professions – public employment. This is no longer the case. The state can no longer possibly absorb into employment all university graduates. Now there is a semi-official debate about the unemployment of doctors and engineers and the dismal future of more and more young people with high education. Despite these difficulties many young people still want to become doctors and engineers. The social prestige of such an education, and such a title is still high in the Middle East, combined with a deep-rooted longing to "better one's country". There is also a muted debate about the dismal level of higher education in Syria. Such a debate is carried on worldwide among students and professors. Also in Sweden there are loud complains about the difficulties in higher education when demands in secondary school are lowered and when universities and colleges are forced to accept more and more students with poor educational foundation[xi]. Today higher education worldwide is mass education and clearly faces enormous difficulties. In countries with an extremely young population, like Jordan and Syria, these problems are compounded. The educational institutions whether primary, secondary or tertiary cannot keep pace with the enormous, and still increasing, cohorts of every single school year. Yet putting the young into schools and keeping them there for as long as possible is the goal of policy-makers in the Jordan and Syria. Youngsters can be socially and politically controlled. They stay out of trouble and can be nationally molded.

## GENDER AND EDUCATION

Today gender is a much-debated aspect of education in general and higher education in particular. We saw above that in both Syria and especially Jordan female education has made great strides. In Syria there is still an urban bias to female education. Women are often singled out in development rhetoric and said to be in special need of development and education. The fertility rates and health status of a given population is typically said to depend on the educational level of the female population[xii]. For many states the increased participation of women in education and in the official workforce is used symbolically to stress commitment to progress and development. Women, more than men can be seen as a potential to be tapped. But women are also often the symbol of cultural authenticity (Rabo 1996, Chatty & Rabo 1997) and hence the means and goals for female education continue to be contested.

The Middle Eastern region varies greatly in accessibility and recruitment of women in higher education. In Jordan and Syria school administrators I interviewed claimed that girls had higher grades in secondary school than boys. In Jordan almost as many women as men enter higher education while in Yemen women constitute only 14% of the university students (Mazawi 1999). In the Arab Peninsula women are significantly more than men in institutions of higher learning, mainly because men study abroad (ibid). Women in higher education in the Middle East typically enter "traditional" female concerns like teaching and administrative work seen as a "natural extension of their roles as wives and mothers" (Hijab 1988:68). But more and more enter colleges of science, technology and medicine. The Middle East as a whole, however, still has a fairly low participation of its educated women in the workforce.

Also in Sweden we can discern ambiguities in female education. Universal literacy and universal formal education long history in Sweden. Women have slowly climbed higher and higher on the educational ladder. By 1875 women were allowed to enter all university faculties, but few women actually did go to university (Rabo 1997: 117). In the 1930s around one fourth of the university students were women but by the end of the 1990s a majority (56 %) of the students were women. "Only among the engineering students are men still the majority" (ibid). More and more women continue to graduate school, more and more women teach at our universities, but men still heavily dominate as the prestigious holders of chairs. The Swedish government and the parliament are committed to a policy of gender equality, including education. Women's talents are thought to be "wasted" in higher education. An official report recently stated that "*Sweden needs to pledge its best resources of talent to* *develop the welfare of the country and create new knowledge. It is a misuse of resources not to utilise fully the potential and reserve of talent that women constitute*" (SOU/Official Inquiry of the State/ 1996.29:279, quoted in Rabo 1997:118). The tone of the report feels very familiar. Human potential must be utilised for the good of the nation and for the good of the individual (i.e. women). But Swedish women are, according to the educational authorities, too traditional. They continue to choose the "wrong" and obsolete branches of higher education. Sweden needs to develop science and technology and here funding is much higher than in the humanities, the social sciences and even in medicine. Yet women, much more than men, do not choose these fields for the future. From the point of view of planners in Sweden, women are more of a potential than men, yet their choices are more "wrong". Sweden has a good world reputation as a country of gender equality. Yet gender equality is only partial. A few months ago we had a media uproar when it was discovered that girls, compared to boys, have for the last decade done significantly better in all secondary schools. Now educationalists and policy-makers are worried that the educational system disadvantages boys. The main problem was said to be the lack of male teachers!

## GROWING GAPS

Reformers of educational systems may, like Husén, point out the weaknesses of theses systems, but it seems almost impossible to arrive at a solution. How can the problems of "meritocracy " be avoided in the Middle East? After all, the mechanisms behind "over-education" stem from an honest wish on the part of policy-makers and on the part of citizens at large to enhance and develop the nation and its individuals. Globally we all seem to be caught in an educational race where some are bound to be winners and some to be losers, and yet the losers cannot, and are not allowed to give up. The gap among nations of the world between educational "excellence" and "mediocrity" seems to be ever widening. Yet another problem is that science is talked about as universal and having global repercussions while educational systems are nationally bounded and framed within a discourse of national development. The political economy of science and education is certainly not an economy of even distribution (cf. Alvarez 1992). My essays from Jordan and Syria mirror these ambiguities. Some pupils write that they wish to do graduate work outside the Middle East, preferably in the USA or in West Europe. One girl in Amman writes: " *I see that many boys study abroad and I was against this, but now I have understood that it is important that we learn also from others and that the wishes of the individual are realised* ". On the other hand the pupils keenly feel that they are considered as "educationally inferior" in the West and struggle to counteract this image. "*Arabs are the origin of civilisation and knowledge and science, and we will return to this situation*".

Young students in Sweden are not faced with that particular contradiction. They are told that a study period abroad is important to expand their educational horizons and to enhance the "internationalisation" of Sweden. There is financial support to expand student exchange. It is a stated goal today that at least one third of the students should spend a t least one semester abroad. Most Swedish University students prefer to study in an English-speaking country but a fair number study in non-English speaking countries. Most students prefer to study in the West but there is a trickle also to other countries. Student exchange is hence by Swedish authorities felt to prepare the young generation for a more global future, but the "globe" clearly excludes large part of the world.

On the other hand there are, even in Sweden, many tensions between national development and the "global demands" on higher education. Higher education is almost exclusively publicly financed and deemed to be of vital national importance. The Swedish economy relies very heavily on exports and the development of the natural sciences and technology is seen as a prerequisite for national economic success. Yet the nature of the global economy today is predatory and pays no attention to national economic interests, especially those of smaller countries. It is quite possible that investment in specific fields of research and education will not pay off "nationally". Furthermore Swedish researchers (and industrial interests) in key fields of medicine and electronics can pressure politicians to get more funds. The problem of a "brain-drain" is not acute in Sweden compared to most developing countries, lacking research facilities or paying lower salaries. But the threat is used as a lever in the politics of higher education in Sweden.

## AN UNCERTAIN FUTURE

There are many common denominators between perceptions of the educational policymakers in Jordan and Syria on the one hand and Sweden on the other. There are also commonalties between pupils and students in the three countries. The educational policymakers have to try and make a multitude of demands which fit the economic means. They have to make educational plans for a future, which is increasingly difficult to foresee. Pupils and students are faced with every increasing demand to become competent and useful. Also they have to make educational plans for an unforeseeable future. For all involved education will never be perfect and never fulfill its promises. But the issues and constraints facing policy-makers and students in the Middle East differ in significant ways from the Swedish counterparts. Sweden has an aging population and young educated citizens will probably be much in demand. The young do feel insecure and worried about global threats to the environment and to peace and security. But they have a basic confidence that "things will work out" for themselves as adult individuals. They are also confident that Sweden will continue to belong to that club of rich nations which can afford to spend heavily on higher education. Young Swedish students are also much less concerned with the over-arching educational goals of the policy-makers. They are obviously influenced by policies, by entrance requirements and career opportunities. But formal education for most seems to be just a small part of a larger "life-project". In the Middle East the situation is different. Vast numbers of young people are heavily influenced by hopes created through mass education. For the Syrian and the Jordanian students we should not totally dismiss the idea of the revolution of raising expectations. Many young people in these countries feel cheated of their future. They express that they are unable to get jobs suited to their educational level. Many pupils, especially in my Jordanian material, also harbor deep grievances against the West which, in their eyes, block the successful development of their nation, homeland or region. To always compare oneself and one's country in a global hierarchy of development, and to always have others – outsiders – ranking you as lacking something, is an integral part of these young people's lives. To be seen as an untapped potential, and to see themselves as misused is also part of their lives. How to change this, is, however, another story.

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[i] This fieldwork was sponsored by the Swedish Council for Research in the Humanities and Social Sciences. It was a comparative study of how ideas about development are produced and transmitted in Jordan and Syria. The essays were written anonymously by pupils in classrooms I visited and observed. I asked the pupils to write about their hopes for their own future and that of their country. For more details on the essays see **Rabo** 1992 a and **Rabo** 1992 b.

[ii] For useful overview of this field see **Fägerlind** and **Saha** 1983.

[iii] For critical views on education see for example **Althusser** (education as part of the ideological state apparatus), **Bernstein** (the new class society as reflected in the educational system), **Bourdieu** (on symbolic capital and educational credentials), **Collins** (on the lack of fit between educational merits and societal needs), **Durkheim** (on the function of education in modern societies), and **Freire** (on the educational system as oppressive).

[iv] *Third World* is rightly a highly contested concept today. It is still useful I think to underline the vast gaps in control and use of resources. See **Escobar** 1995 for an analysis of the discursive interconnection between development and underdevelopment, and the link between this discourse and social phenomena.

[v] For a highly original and thought-provoking cultural analysis of modern education see **McLaren** 1986 (3rd revised edition 1999) Schooling as Ritual Performance.

[vi] All Syrian figures are from Statistical Abstracts, Syrian Arab Republic, 1991.

[vii] The Jordanian figures are from Jordan's Five-year plan 1986-1990.

[viii] I find it highly interesting that the students in their essays did not follow common cultural stereotyping; i.e. that Arabs are family-centred and that Swedes lack a family feeling. These essays cannot be used to claim the opposite, but only indicate the interests expressed among these young adults.

[ix] In the middle of the 1990s open unemployment rates reached 10% in Sweden. A further 6% of the workforce was engaged in continuing education of some kind. High unemployment has been the most severe test to the endurance of the classical Swedish welfare model which emerged especially after WW II.

[x] The Bildung (Sw. *bildning*) tradition has been very strong in Sweden (and Scandinavia) both among liberal and socialist thinkers and policy-makers in the last hundred years. Education was seen as both a civic right and duty to "enlarge" the potential for democratic interaction.

[xi] There are no objective criteria with which to test today's students against former generations. Yet everywhere teachers and professors complain that the standard and level is lower "today". This is not a new phenomenon, and can be seen as an indicator of the gap between ambitions and educational resources. Hence the complaint can be seen as healthy criticism. On the other hand it is also demoralising for students to hear that they do not measure up to the expected level.

[xii] Demographers find a statistically significant relationship between female education, lower fertility rates and lowered infant death. Clearly such a related cluster exists. These models are presented as causal but are not, in fact and can furthermore not be used to predict the effects on fertility and infant mortality correlated to educational levels among women. For conventional example of a demographic development model see **Winckler** 1999. For interesting and complex comparison between Morocco and Egypt in terms of fertility and female education see **Courbage** 1994.

TEND 2000

# Crossroads of the New Millennium

## Learning Knows No Borders

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Workshop 2

# Abstract

Specialists are being asked to perform more and more managerial tasks. The need for management development increases in gathering speed. To meet this growing demand, the Hong Kong Polytechnic University joins with the University of Warwick in England to introduce to Hong Kong the Integrated Engineering Business Management Programme which has been very successful in the United Kingdom on account of its relevance and practicality to the actual needs of the society. It is a unique part-time modular course for practising managerial staff. The broad spread of faculty members drawn from the constituent universities ensures the course content is relevant and constantly updated to reflect the latest advance in technology and practice.

This industry-led programme adopts a multi-disciplinary approach and aims to develop students to appreciate modern management technology and to broaden knowledge in technical and managerial areas to analyse problems and synthesize solutions through a wide range of case studies. Academic staff and industrial supervisors collaborate on course management and operation. The global network of learning venues offers wide exposures to various cultures. Students may attend modules in different countries with freely transferable credits. Since 1990 more than 1,200 professionals sponsored by 600 companies have joined the programme. Current participants number more than 400.

**Keywords:** international experience, globalisation of education, joint corporate-academic professional development, multi-disciplinary enrichment opportunity

# Learning Knows No Borders

## THE HONG KONG POLYTECHNIC UNIVERSITY

The Hong Kong Polytechnic University (PolyU) is the largest government funded higher education institution in Hong Kong. In 1999 there were 26,000 full-time and part-time students.

Courses taught at the University cover a wide range of subjects most of which are vocationally oriented and include engineering, business studies, and health care studies. It is an internationally recognised centre for the provision of continuous professional training, consultancy and applied research services. It ranks first among Hong Kong institutions in meeting the community needs, providing courses of practical value and moving with the time. In broad terms the University makes significant contributions towards the territory success by providing the public and private sectors through strong partnerships with business and industrial sectors.

## THE MANUFACTURING INDUSTRY IN HONG KONG

In the past two decades or so China reverses its closed-door policy, by adopting an open one. It welcomes foreign investments to set up manufacturing plants within its jurisdiction. In the Chinese regions bordering Hong Kong the labour cost is only 10% of that in Hong Kong and the cost of land is much lower. Cashing in on these costing benefits many business concerns relocate their manufacturing operation from Hong Kong to China. It is found that a much larger labour force may be employed without an appreciable increase in, if not reducing the total labour cost. And this is thc generally adopted practice.

The relocation of the manufacturing plants entails the transfer of technology or know-how from one place to another. Many middle level managerial staff based in Hong Kong finds that they have to communicate to a much larger labour force but of less industrial inclined. Unlike before when they are in close proximity reducing the obstacles in communication to the bare minimum they now have to control the labour force over a much longer distance. The technical staff is often confronted with managerial issues, which they have not had any previous training to deal with. The need for management training is ever increasing to meet the changing operating environment.

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## MANAGEMENT DEVELOPMENT IN HONG KONG

Many resort to educational establishments for the necessary training. They find the access to management development programmes is often qualified by previous academic endeavour. This puts those who were, for some reasons in the past, denied the opportunity of the main stream schooling in some disadvantageous positions. The PolyU, constantly advocating the importance of practical aspects, votes to help these people caught in between and explores channels for assistance. The partnership with the University of Warwick in England is established with the above being one of the major objectives.

## THE UNIVERSITY OF WARWICK, UK

The University of Warwick (Warwick) in the United Kingdom ranked fourth among UK tertiary education institutions for quality of research by University Funding Council in 1997. It, like the PolyU, attaches great importance to applied-oriented knowledge. Its Manufacturing Group, with 350 staff members, is probably the largest operation of its kind in the world with major centres in Hong Kong, China, Malaysia, Thailand, India, and six European cities. Over the past 15 years the Group has developed a substantial reputation particularly for its post-graduate and post-experience training programmes which can now be regarded as a model of industry-academic partnership with industry playing a full collaborative role in the design, development, delivery and monitoring of the programmes.

## THE INTEGRATED ENGINEERING BUSINESS MANAGEMENT PROGRAMME (IEBMP)

The PolyU working with Warwick launched a programme to support Hong Kong industry. The platform features a new modular programme of management training which consists of three tiers, namely, the Engineering Doctorate Programme (EngD), the Integrated Graduate Development Scheme (IGDS) and the Integrated Manager Development Scheme (IMDS) leading to the awards of the doctorate degree in engineering, master degree of science and the post- experience diploma, correspondingly. All the awards are granted by Warwick thereby ensuring international credibility. The programme is modelled on one that is being currently operated in the United Kingdom by Warwick with the support of many major British companies. It is designed to provide an executive development programme to develop practicing managers in industry. This part-time programme adopts a 'system' approach with emphasis on the practical use of subject content and three tier structure with easy entry and exit facilities located at strategic points are interlinked to offer further study advancement opportunities to participants.

## THE INTEGRATED MANAGER DEVELOPMENT SCHEME

To illustrate the operation of the Programme IMDS is cited. There is no formal academic qualification for admissions but favourable consideration is extended to candidates with maturity and substantial working experiences. Successful completion of the Scheme leads to credit transfer opportunities into the M Sc level IGDS programme. Subsequent credit transfers to the Ph D equivalent EngD programme are also possible. Students, having successfully completed 12 out of 16 modules and 2 in-company projects within the two years registration period, are eligible for the award of Post-Experience Diploma in Engineering Business Management. Diploma holders are eligible for Fellowship of the Institute for Supervision and Management of the United Kingdom.

## THE MODULES

The IMDS modules cover a wide range of subjects, from general business topics such as Corporate Management, through management skills like Team Working, to advanced technology such as Robotics. Each module consists of 20 hours of intensive lecturing, tutorials, seminars and practical activities and is run on the PolyU campus. On average attendance is required once every five or six weeks. Teaching faculty is drawn from staff of the two constituent universities and specialists from other universities, industry and research organisations and consultancy practice. This broad spread of teaching support ensures that the course contents are relevant and constantly updated to keep abreast of latest advance in technology and practice. Each module is followed by an assessment in the form of a brief questionnaire session. At Warwick there are more than 50 modules offered to students throughout the year. In Hong Kong the number is curtailed by the availability of lecturing staff, local relevance and other constraints.

## QUALITY ASSURANCE

Each module concludes with a module review, which is designed to aid continuous improvement of the module and facilities. Participants are asked to contribute in the following ways:

- individually review each session,
- individually review the module, and
- participate in a group discussion on the module at the end of the module.

The session reviews provide a full range of feedback to monitor the scope and relevance of the content, and the effectiveness of the communication during the sessions. Changes in content, notes or speakers will be made if necessary as reviewed. The overall module review provides a balanced feedback to monitor the relevance of the objectives and the extent to which they have been addressed and met. The group discussion and presentation made afterwards further balance the feedback but also allow the module tutor the opportunity to clarify any misunderstandings, which may have arisen, and to respond to the most significant comments.

## TUTORIAL SYSTEM

Each participant is assigned an individual tutor. The participant and tutor meet regularly to discuss and monitor progress of study. The tutor is also a source of guidance and advice to the participants. In particular, the tutorial system is proven of great value to assist participants in re-entering the academic environment after a long absence and to restore their confidence in the process of self-enrichment, thereby ensuring that the efforts devoted are well justified.

## THE PROJECTS

Each student is required to complete two job related projects, each being over a 3-month period. Each project is expected to spend 80 - 100 hours of effort and will be presented in the form of written dissertation, backed by oral presentation, if necessary and assessed by two supervisors, one industrial and one academic. These projects help to:

- transfer learning from the university to the workplace,
- widen participants' knowledge and understanding of the company, and
- provide real benefits from the Scheme to the company.

## THE PARTICIPANTS

Participants are current or emerging supervisory or managerial staff in engineering or industrial companies and public bodies. They do not require formal qualification, academic or otherwise, to commence the Scheme, but normally have several years of relevant working experience and a level of intellectual capability and personal drive to meet the demands of the programme. A satisfactory level of proficiency in working with the English language is also required, as the medium of instruction is English.

## GLOBAL NETWORKING

Apart from Hong Kong Warwick operates the Scheme with corresponding local partners in various locations in the world, namely, the United Kingdom, Malaysia, South Africa, Thailand, India and China. Participants are given opportunities, and very often encouraged, to attend parts of the programme in locations other than Hong Kong. Thus they are exposed to different cultures, the understanding of which would be beneficial to the potential career and personal development of participants.

## THE ROLE OF INDUSTRY

Industry is represented on a Steering Committee, which defines the course scope and monitors its operation. The Committee meets at regular intervals. Detailed module design and course deliveries are carried out in collaboration with industrial partners. Industry also provides teaching members so as to ensure the coverage of the practical aspects. Industry is benefited from the enhancement of the quality of participants after the course and the result of the project work, which is drawn from real issues in daily operation, not fictitious exercise for the sake of exercise. Performances of the participants are jointly assessed by the academic and industrial faculty members.

## A SUCCESS STORY

Sponsored by the British government, Warwick started the IEBMP in 1981. The programme involves over forty blue chip British companies. In Hong Kong the programme was launched in 1990. It has been sponsored by leading local enterprises though the government assumes a passive role. The number of participants surpasses the 1,000 mark. Current active participants number more than 400. Industry hails this cross boundary, international and intercultural, multi-disciplinary, industry-academic collaborative programme providing excellent human resources development functions. Participants find the programme providing application oriented knowledge appropriate for their further career developments. A number of tertiary institutions in China have asked or are negotiating for collaborative joint ventures.

## CONCLUSION

Companies who recognise the need to develop their managerial staff require a flexible, responsive programme tailored to their needs. This comprehensive programme is a proven approach, with a strong emphasis on partnership with industry and relevance throughout. Its success is substantiated by the wide spread of sister operations in various parts of the globe.

## REFERENCES

- *The Hong Kong Polytechnic University Annual Report*, 1999
- *The University of Warwick Annual Report*, 1998

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Crossroads of the New Millennium

# Technological Education For Women As A Tool Of Upward Social Mobility, With Reference To The Middle East

Prepared and Presented

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Workshop 2

# Abstract

Education, including technological education, for women is widely recognised as a vehicle for upward social mobility. As pay tends to be higher for jobs in the technological field, technological education would lead to a higher percentage of women occupying higher-paying jobs, leading to enhanced social mobility.

Because of sexually differentiated role distribution, the roles of women tend to comprise a larger component of what are referred to in the paper as the roles of "reception, following and consumption," which suggest passivity. Technological education, which increases influence, would be bound to make women more active and involved members of society.

Influence is more associated with technological use, industrialisation and urbanisation. Thus, technological education and employment are bound to enhance women's mobility.

# Technological Education for Women as a Tool of Upward Social Mobility, with Reference to the Middle East

The interaction of science and technology with society will have a far-reaching say in determining the future of the peoples of the Middle East. Specifically, the study of science and technology is an important factor for the improvement of women's status in Arab society.

The focus of this paper is on the role of technological education in upward social mobility. Ways in which education brings about such mobility are addressed, followed by an attempt to point to the special effects of technological education.

## TECHNOLOGICAL EDUCATION AS A VEHICLE OF UPWARD SOCIAL MOBILITY

Education, including technological education, for women is widely recognised as a vehicle of social mobility (used here in the sense of upward mobility). Through education, women would circumvent the effects of factors which retard their mobility. Technological education is more effective than general education in neutralising the retarding effects of certain social institutions in the domain of social mobility. For example, it is more objective than education in the social sciences and humanities. Essentially it is devoid of social and cultural conditions. Obviously, non-professional, extraneous factors such as friendships, nepotism, bribery and other social factors may also play their role in the choice of a person to fill such a vacancy in technology. Thus, the one chosen may not be the most qualified to perform the job. In spite of that, with the increasing recognition of the importance of technology for development and given the greater spread of technological education and of social democratisation in Arab society, with more consideration being given to fairness and equality, the trend in hiring is one where women with such education will claim a significant share.

Education of women is one of the most effective ways to improve women's conditions, an urgent priority in many parts of the world. Through education, women would improve their self-image and discover much of their potential. They would improve their understanding of the nature of politics, learn about their lives, society and state; they would become more aware of their rights, whether human, legal, economic, political or otherwise, and of the need to improve and expand them; and they would become more articulate in voicing their positions and grievances. Education would encourage them to engage in public and political affairs and to become more involved in matters that concern society as a whole. They would be more able to make their voice heard and taken account of.

Education would contribute to a better knowledge by women of the prejudices, stereotypes and other negative habits and customs that account for the inferior conditions of women.

## EDUCATION, EMPLOYMENT AND INCOME

Discussion of the specific effect of technological education of women on their social mobility must take into consideration the prevailing social and cultural conditions and values, including the forces responsible for the subordinate position that women continue to occupy. At the present time, there are remarkable gender disparities in secondary-level and higher education in terms of overall enrollment. Women make up a smaller percentage of enrollment and the level of education of women is relatively low. There is a high percentage of illiteracy among women, the figure varying from country to country. The percentage of female holders of high-school and college degrees is much smaller than that of male holders of such degrees.

College education exhibits gender inequality not only in terms of overall enrollment but also in the nature of the fields of education. Whereas there has been a much higher percentage of women students in traditionally female-dominated fields of education, the percentage is much lower in traditionally male-dominated fields, such as engineering, computer science and natural sciences. There may be a sort of alienation of women from science and technology. The majority of women in higher-education institutions are concentrated in the humanities and social sciences. In vocational schools, women tend to concentrate on "feminine" non-science-based occupations, such as the arts, teaching, sewing, handicrafts and nursing. Jobs in certain sectors of the economy go hand in hand with a higher level of education and with particular fields of education. The lower level or complete lack of women's education and their tendency to choose traditionally female-dominated fields of learning have contributed significantly in reducing job opportunities available to them in both the public and private sectors. These same reasons have also held back the number of qualified women in higher-paid technical jobs. As pay tends, in important sectors of the economy, to be higher for jobs in the technological field, this difference in the nature of fields of education has resulted in women having lower incomes. Furthermore, the lack of even low-paid job opportunities has accounted for the large number of women living in poverty, and thus deprived of social mobility. Technological education would lead to a higher percentage of women occupying higher-paying jobs, with the attendant consequences of enhanced social status, security and mobility.

Technology, with its expanding application and constant development, is reducing the heavy reliance on manual labour. With the increase of technology-based employment, some manual workers are displaced. As more men than women, relatively and absolutely, have technological education and employment, they would be relatively less affected, in case of displacement, than women. For women to be less vulnerable to the shift from a labour-based to a technology-based economy, they would need technological education.

## TECHNOLOGICAL EDUCATION WEAKENS GENDER DIFFERENTIATION OF ROLES

Much of human society is sexually differentiated. This differentiation is easy to recognise, for it is exhibited in the roles of men and women, in their self-perception and in the way they relate to the world. Forms of sex-differentiation are not inevitable; they are alterable. A primary factor which contributes to disparities between males and females in the nature of fields of education and in the percentage of both gender groups in these fields at the college level in the Middle East (and this is true of the rest of the developing countries and, in varying degrees, even the whole world) is the social and cultural perceptions and expectations of role distribution and assignment to members of each gender. These perceptions and expectations, which are derived from various sources, are combinations of objective and subjective elements. One example is the social perception - perhaps enhanced by educational policies and practices - of women as biological reproducers and producers of a future workforce. This works in the direction of deepening the subordination of women and narrowing the range of functions they perform by influencing their ability to control their life opportunities at home and in society as a whole. As women are biologically capable of adequately functioning in a number of fields which have been dominated by men, this role assignment reflects cultural prejudices, stereotypes and wrong attitudes towards them. Thus, women are channeled to fill jobs with lesser pay, contributing to their economic weakness and hampering their social mobility. This unhealthy state of affairs could be partially corrected by women's technological education, which would increase job opportunities with higher pay in the so-far male-dominated fields of education and employment. Moreover, the structure of the college curriculum has a strong say in deciding students' performance. The curriculum feeds societal perceptions of women's roles in the family and society through gender-role stereotypes in textbooks. Social and cultural perceptions of the division of labour and expected gender roles leave their impact on patterns of gender disparity in educational processes and its results.(1)

Perceptions and expectations of role distribution and assignment have been an important factor in the concentration in certain fields of education and employment both for women and men, including paucity of women with technological education and profession. These role perceptions and expectations resulted in the emergence of a dependent-independent relation between members of the two sexes. This relation has its implication for many aspects of women's life and experience: attitudes, ambitions, mobility and others.

The 1979 Conference on Science and Technology for Development adopted a resolution on "Women, science and technology," which called on member states to facilitate:

a) The equal distribution of the benefits of scientific and technological development and its applications to men and women in society;
b) The participation of women in the decision-making process related to science and technology, including planning and setting priorities for research and development and in the choice, acquisition, adaptation, innovation, and application of science and technology for development;
c) The equal access for women and men to scientific and technological training and to the respective professional careers."(2)

If the national objective is to bring about upward social mobility, then more women should be trained in non-traditional fields. In 1980, a UNESCO report on vocational and technical education for women arrived at a similar conclusion. The report said that men were accorded an automatic priority in educational planning, in particular in the third world.(3) Ways need to be found to encourage women to enter and perform well in non-traditional disciplines. This matter is recognised in the Platform for Action adopted at the United Nations Fourth World Conference on Women (Beijing 1995), which touched upon the need to improve women's access to vocational training, particularly in the fields of technology and science. The Platform further notes that women and girls are concentrated in a limited number of disciplines, and that governments should take action to ensure a better access by women to and participation in technology at the college level. Such action may include a supportive training environment and development of appropriate curricula and teaching materials.(4) To achieve this improvement, women should be provided by governmental and non-governmental agencies with information about the availability and benefits of technological education and of diversification of vocational training.(5)

As social, economic and industrial development and modernisation have increased the need for technological education, the low participation of women in technology and their concentration on "feminine" subjects and occupations at the college level adversely affect their employment opportunities and their prospects for social mobility. The inadequate preparation of women for technology and their career pattern of heavy dependence on non-science-based occupations limit their access to the labour market and restrict their chances of entering a wider range of occupations.

Technology is increasingly becoming a resource in economic and social development. It is becoming instrumental in overcoming certain developmental difficulties. In some contexts, perhaps nothing would "move" without the technological factor being present. People with knowledge of technology, then, are people who are needed by the state and society and, consequently, who are mobile socially.

### RECEPTION AND INITIATIVE

In various walks of life, including government, administration, teaching and technology, in all societies, and in particular third world countries, including the Arab countries, the roles of women tend to comprise a larger component of functions which could be described as reception, following and consumption (not necessarily in the material sense), whereas the roles of men tend to be those of involvement, in the sense of serving as a source of value originators and value producers, as pace setters, initiators and directors. This seems to be the dominant picture, even though sometimes intra-role and inter-role interactions take place across the social board.

Reception, following and consumption suggest, in a sense, passivity. To be passive in these fields suggests lack of the ability to influence; it suggests that those playing such roles are the "objects" of the activities of those who play the role of the creators. In this state of affairs, where men are the dominant, the followed and the originators, and women are the passive followers, consumers and recipients, social mobility for women is very much affected. Thus, women can exercise little influence: they are too weak to promote their interests, and defer to men. Whatever influence they possess is largely confined to the home. Human society is a political society, in the sense that in every situation there is the use of influence to achieve certain objectives. In this context, men tend to be the influencers and women tend to be the influencees.

A considerable portion of employment opportunities depends on technology- and science-related qualifications. Technological education forms the basis for a much broader range of employment in various commercial and industrial processes. It creates a greater sense of confidence to live in the modern world. Women need this confidence to claim their rightful share of society's assets. With technological education, women's influence is bound to be enhanced as a higher percentage of women would be employed in the technological field. Women's role as mere recipients would thereby be weakened and their role as active, involved practitioners would be enhanced. With this employment they would become directors and influencers rather than recipients and consumers.

With the constant and tremendous advance in technology and science and with the increasing relevance of technology and science for national planning and development, the dependence of employment availability on technological education is increasing. With this employment comes social mobility. Because of its specialised nature, technological education has a considerable influence in shaping one's attitudes. It helps develop attitudes based on more distinct, differentiated and specialised concepts drawn from the domain of technology. This enables women to better articulate their ideas and positions professionally and socially, thus enabling them to be more effective in playing their many roles in the interrelated settings of the state, society, family and workplace.

## TECHNOLOGICAL EDUCATION, INDUSTRIALISATION AND URBANISATION

The developing world, including the Arab countries, has been witnessing a faster pace of urbanisation and of use of technology. Industrialisation and technological use seem, for several reasons, to coexist or to be associated with urbanisation. Influence, be it economic, cultural or social, has been associated with such trends. Technological, more than non-technological, education is more relevant for such trends; it has more of a common ground with them; it is more instrumental, objectively speaking, in exercising influence in this context. Technological education for women would thus be bound to make their presence in the changing economic and social structure and dynamics more pronounced and more functional in the socio-economic system.

In developing, industrialising and modernising societies, technological education gives more opportunities to market one's skills.(6) This enhanced marketability, which is translated into increased income and professional functionality, is contributing to social mobility of women in the Middle East.

## TECHNOLOGICAL EDUCATION AND ENTRY TO THE PUBLIC DOMAIN

Gender inequality occurs in various social "locations" or units of social organisation, such as the community (public sphere) and the household (private or domestic sphere). For various historical, social and cultural reasons, women are more associated with the "domestic" rather than the "public" sphere of social life.(7) This domestic-public dichotomy is derived from a number of factors, one of the more important of which is the role of women as the mothers and nurturers of children. "Domestic," according to some sources, was defined as "those institutions and activities organised around one or more mothers and their children," and "public" as "those activities, institutions, and forms of association that link, rank, organise, or subsume particular mother-child groups."(8) This shows that the categories of domestic and public were seen as linked in a hierarchical relationship in which the public is more important than the domestic. Jobs requiring technological education are more likely to be associated with the public domain. Thus, women's technological education and employment would mean their increased employment in the public sphere, where their voice would be better heard on matters of social, economic and political organisation and management.

As technological education leads to technological employment, which is a source of better income and helps move employees from the domestic to the public sphere, and thus enhance their influence, then women with this education would achieve greater social mobility. Technological education is objective. Merit for those with this education is based on objective, achievement-based criteria. Because of that, in employment it is not subjective role perceptions and expectations which determine women's functionality and employability, but the objective element inherent in technological education. This would be an effective way to remove or weaken the effect of such role perceptions and expectations.

## PATRIARCHAL SYSTEM AND ITS EFFECT ON MOBILITY

A patriarchal system has greatly contributed to the prevention of women's - and, though to a lesser extent, men's - mobility. The main features of patriarchy are control by the father of the behavior of children. This involves full authority, based on tradition, of the father; the downward direction of instructions and commands, with no possibility of dialogue; and full compliance by children. These privileges are ascribed to the father by virtue of tradition, where subjective factors such as age, wisdom and masculinity make up a major component. In assigning to a family member only a role of recipient, follower and compliant implementer, the patriarchal system limits women's mobility.

Occupants of jobs which require technological education enjoy an important and recognised status not by the consent of the patriarch, but independent of him. As women achieve income growth, functionality as occupants of jobs which require technological education, and status promotion which comes with technological employment, without reference or relevance to the patriarchal rules, then the patriarchal system is weakened; it loses its grip on human mobility.

## REFERENCES

- N. P. Stromquist, (1989). "Recent Developments in Women's Education: Closer to a Better Social Order?" In R. Gallin, M. Aronoff and A. Fergusson, eds., *The Women and International Development Annual,* vol. 1 (Boulder, Colo.: Westview Press, 1989), p. 118.
- United Nations, (1979). *Conference on Science and Technology for Development,* p. 43.
- E. M. Byrne, (1990). *Gender in Education* (Avon, UK: Multi-Lingual Matters ), p. 7.
- United Nations, *(1995), "Beijing Declaration and Platform for Action Adopted by the Fourth World Conference on Women: Action for Equality, Development and Peace* " (Unedited advance text). (Beijing: United Nations, September 1995), pp. 24-25. Ibid., p. 26.
- D. B. Holsinger, (1974). "The Elementary School as a Moderniser: A Brazilian Study," in A. Inkeles and D. B. Holsinger, eds., *Education and Individual Modernity in Developing Countries.* Vol. 14, International Studies in Sociology and Anthropology.
- Leiden: Brill, A. A. Idike, (1991) "Transformation of Rural Women in Nigeria: Myth or Reality?" In Fatima Babiker Mahmoud, ed., *African Women: Transformation and Development* (London: Institute for African Alternatives).
- H. Moore, (1988). *Feminism and Anthropology* (Minneapolis: University of Minnesota Press);
- Michelle Z. Rosaldo, (1974). "Woman, Culture and Society: A Theoretical Overview," in M. Rosaldo and L. Lamphere, eds., *Woman, Culture and Society* (Stanford: Stanford University Press). Ibid., p. 23.

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Crossroads of the New Millennium

# Information Technology And The Marginalisation Of Regional Cultures: Rambling Thoughts From The University Of Calgary Experience

Prepared and Presented

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Workshop 2

# Abstract

In the last decade significant advances in information technologies in the Euro American world have fostered the creation of information monopolies. The prices imposed by the monopolies, whose products are largely in the English language, have caused academic libraries to focus almost exclusively on international scientific and cultural materials demanded by their researchers, since their work is constantly being assessed in an international rather than a national context. The result has been the insidious and progressive marginalisation of regional cultures. After careful deliberation in its 1998 "Library of the Future Task Force," the University of Calgary determined that

an integrated approach to information resources incorporating both production and consumption activities could significantly improve the situation. The University would move to a "just for you" library, providing information through contracted electronic access when ever possible. To ensure that it became a net contributor to the preservation and dissemination of knowledge rather than just a consumer of products of the international monopolies, its intentions included the preservation of primary materials and the publication of manuscripts in digital form relating to the region to ensure that national and regional community needs were taken into account. Whether this approach will succeed in reducing the marginalisation of regional culture remains to be seen.

# Information Technology and the Marginalisation of Regional Cultures: Rambling Thoughts from the University of Calgary Experience

In the last decade significant advances in information technologies have allowed for the aggressive commodification of information particularly in North America, Europe and Japan. Until recently sophisticated information was available at no cost or little cost to scholars, to the communities in which they lived, and to students. Today, enveloped in the illusion of the Web's inclusive anarchy, information technology has allowed for the development of information monopolies that are threatening the competitive abilities of smaller countries, and the cultures of marginal groups. In Canada national site licenses are required for electronic data, for example, because only one of the nation's universities can afford them all. English language interests, who are for the most part located in the United States or Great Britain, further dominate the information monopolies. As important as the growth of the information monopolies, that are threatening to marginalise all but the wealthiest nations and their universities, is the growing apparent irrelevance of regional cultures.[1]

My argument is as follows. Because the smaller regional universities are struggling to pay for the new technologies and the information they transmit, they begin to neglect the information wealth of their own regions. The budget to collect is gone. The cost to digitise is too high. The market is too small. There are no aggregated "purchasers" of this regional information. "North American" or "European" information providers often do not index regional cultural monographs or serials.[2] When they do, the technical frameworks that determine their appearance on line act as a distorting filter for regional cultural realities. Indeed as regional universities increasingly become consumers and producers of global information, regional cultures become marginalised by their own universities, who often see success in a global rather than community or regional context.

In Canada the response to the commodification of information by increasingly global information monopolies has been to fund a national site-licensing project, which would see all sixty-four of its senior universities with the same general suite of electronic full text materials, indices, and data bases.[3] The Province of Alberta, one of Canada's wealthiest, has further responded to the fear of being excluded from the cornucopia of information the new age will bring, by devoting $4 million Cdn through a provincial consortia, The Alberta Library, to purchase full text data for its public and post secondary institutions.[4] Again none of these funds are explicitly designated for regional/cultural digital projects.

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[1] See various discussions for example by Stephan Harnad at http://www.princeton.edu/~harnad/

[2] OCLÇ announced in its last Newsletter that it was finally going to be including local history in WorldCat used by most North American University libraries (Nov/Dec 1999), No. 242, p.9.

[3] See details of the proposal at http:/aix1.uottawa.ca/library/carl/projects/CFI/project_rationale.htm

The impact of libraries and their devotion to the new global technologies on regional cultures is real and evident. Throughout the world, for example, library systems are generally American or British, although there are some exceptions. These systems have difficulty with non-roman orthography, for example Cree syllabics or Arabic script.[5] What happens when foreign technology drives "cultural systems" like libraries? Why acquire, or even create minority languages when the large scientific data bases, and the sophisticated information aggregators like Netlibrary, Thompson, or Elsevier exclude these because of the low demands, and more important because the economic poverty of the homelands of the minority languages. There may be sixty million Tamil speakers, but little profit in the aggregation or indexing of their digitisable heritage. Indeed it has been argued that in the next two hundred years most of the world's 6000 languages will disappear because of the power of these information monopolies.[6]

While many cultures may prove resilient, the indigenous cultures of the circumpolar world, where the University of Calgary finds itself are not. The introduction of "information aggregators" is having a profound impact. The European concept of literacy and cultural transmission and its traditional aggregator of information, the library, has eroded oral tradition and the wisdom of the elders in the Aboriginal communities. While the integration of the Aboriginal concept of community learning, and the importance of transmission of knowledge through elders into "knowledge" centres (libraries?) is possible, it has rarely been done well.[7]

The Europeanisation/Americanisation of information is an issue that should be critical to all "marginalised" cultures particularly those who are interested in the advancement and even survival of the unique languages that are their underpinnings. Without archived information, one example being books another digital archives, and a continuing language dynamic, the culture will surely die. There is not enough vitality in native publishing industries to ensure that the language will survive. Greenland offers hope, but even here experts are not sanguine about the long term.

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[4] For details see http://www.library.ualberta.ca/altalib/

[5] Zahiruddin Khurfshid, "System migration: challenges for libraries in the Arabian Gulf region," The Electronic Library (Vol. 16, No. 3), pp. 171-4.

[6] Gregory Stock, Metaman (London, 1993), pp. 87-88.

The digital world will not likely bring Aboriginal peoples cultural salvation. Will Cree, Blackfoot, or Inuktitut and their varying orthographies be incorporated into the major search engines? A careful prowl through these search engines will find "samples" of these languages, but I have found no complete dedicated sites in which all materials are for example in Cree.[8] Instead these languages are treated as Internet oddities in the WWW Zoo.[9] Why this is so, is easily apparent. First the opportunities for commodification of this information do not exist. Advertising markets are non-existent and pay-for-view is not viable. Second, often there is little that can be put in digital form. The Cree and Blackfoot languages have a written culture, but they are fragile and have never found strong voice in the regional presses. Most important, the young people, who are the most computer literate, are quickly losing the language, inundated as they are with English-language Web sources.

Alberta's English and European language communities have also been impacted by the commodification of information. The two senior academic libraries in the province are generally more concerned with ensuring that the sophisticated databases of the world are available to their increasingly international researchers, drawn for the most part from the United States, than serving the cultural needs of the region. There are some Canadian mainstream cultural materials, but only marginally acceptable materials for other culture groups, like for example Alberta Ukrainians, who form a majority in East Central Alberta. There the local tourist facility, the Province of Alberta's Ukrainian Cultural Heritage Village, hosts the only real cultural Web site, (http://collections.ic.gc.ca/ukrainian/) for this group. It successfully combines language, and material culture in a tourism-marketing product.

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[7] Reg Crowshoe and Sybille Manneschmidt, Akak'stiman: A Blackfoot Framework for Decision Making About Health Administration and Services (Brockett, 1997).

[8] See for example http://www.nisto.com/cree/. It is curious that in this University of Ottawa site, that while Cree is featured and some stories are in Cree – the discussion groups and most of the material is in English. See also http://aboriginalcollections.ic.gc.ca. Again there is some limited use of native language, but the majority of the text is in English.

[9] See Gordon Hill, Native Libraries (London, 1997) for a discussion on the impact of libraries on the minority cultures of the circumpolar world.

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Those who would counter this, state that the regional communities can now use the Web to overcome obstacles placed by information aggregators and their monopolies. Communities can now create their own sites to evidence their language and culture. The market place will determine whether there is take-up. The point is however that archival Web sites require capital, operating funds and purpose. The enthusiasm of a small volunteer driven culture group without technical support will not be able to sustain their new virtual archive through the following centuries. While some academic libraries have shown themselves to be concerned and are working with regional groups to sustain community focus, most are concerned with nation or "national treasures" in their digitisation projects. Governments have shown some inclination to support this digitisation of their national treasures, but generally the initiatives have been by the dominant English-speaking nations, whose cultures already control much of the Web's content.

Canada and Alberta have lagged behind American and European initiatives. The government of Alberta for example has put no designated funds into the creation of digital cultural content that would allow regional history to participate and be validated by a presence on the Web. The federal government has been equally parsimonious in its caring.[10] Sadly neither Canada's National Archives nor its National Library has shown any real interest in providing Canadian full text access to the documentation of their past. America's Mellon Foundation, and Industry Canada, the National agency for encouraging economic growth, have largely under written the best of the activities, for example, "Canadiana Online," by the Canadian Institute for Historic Microreproductions.[11] It contains full text of all Canadiana published prior to 1920. Overall, Canada has the pipeline for information, but little content. This is symbolic of the predicament of the Canadian nation. Canada has an incredible capacity for technological innovation – but allocates few resources to support its cultures.

I should emphasise that I am focusing on peer-adjudicated electronic material or significant bodies of primary materials that would allow Canadians to reflect on themselves and on their past. My point is that while there are limited sites that advertise, and create awareness there is little of the sophistication that marks the scientific databases supported and sold by the large information aggregators.

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[10] See for example http://collections.ic.gc.ca which lists many of the sites across Canada sponsored by intermittent grants from Industry Canada.

[11] See Http://www.canadiana.org for the funders and origin on this project. While there are significant Canadian partners the project is being executed in the United States. It should be noted that university and state libraries not presses are involved in this project. In the pre electronic or pre microform days this would have been the responsibility of the scholarly press.

The responsibilities of medium-sized universities in addressing these regional cultural issues are subject to debate. Many argue that they must strive for international scientific excellence, and that they must measure their success against their peers at the great English-speaking Universities whether Harvard, Yale, Oxford, MIT or Cambridge. Today, libraries serving doctoral institutions struggle to provide information support for the aspirations of their researchers. In the next few decades, at least from a technological perspective, and if money is no object, any middle-range university will be able to duplicate the current holdings of the world's great institutions. The private sector and the universities themselves and their political masters stand to make significant revenues from the new intellectual properties they have helped create from this information. Once we have achieved information homogeneity in the pursuit of "metaman" researcher, what will differentiate the regional and middle range institutions, except the differing numbers of Nobel laureates?

Information Resources at the University of Calgary is becoming aware of these issues. Rather than focus its resources entirely on becoming one of the "virtual" extremities of the great universities, it has, as well, moved to root itself in the community and its culture with the objective of enriching both. How did this happen. Was there a sudden revelation of the evil realities of information globalisation? The approach that evolved at the University of Calgary was rather the result of a university community's genteel awakening over the last five years. It is best illustrated in its 1998 "Library of the Future Taskforce" which was charged with envisaging and developing a University strategy for information resources management.[12]

In 1995, the University realised that with the decreasing value of the Canadian dollar, the increasingly control of information by monopolies, the concomitant dramatic increase in prices, and the collapse of the province's resource revenues that its library was at a crossroads. Rather that abdicate to the crisis of terror, and allow the City of Calgary, an urban area with over one million people, to become an information have-not city, which it is still in the danger of becoming, the University decided to buy instant access to any information the University community needed. Access would be through the new technologies. The University would be served by a "just in time" rather than a "just in case" increasingly leased information. The University emphasised that its library would continue to be important as an information access point. However, it would build its national and international reputation not on being an "access" point, which indeed every academic library in Western Canada has become, but rather on its unique primary source collections. At the University of Calgary, these collections already existed (as much through accident as design). As important they reflected the heritage of at once Canadian and Albertan communities who had been questioning the relevance of their own identities within North America Free Trade fertilised continentalism.

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[12] Http://www.ucalgary.ca/library/lftf/index.html

In order to realise its potential role in archiving community information making it available while providing world information to its students and researchers the University reorganised all of its information related units. Units responsible for the production of information (the University of Calgary Press), the assemblage of primary information (the University Archives, and the Canadian Architectural Archives, the Canadian Literary Archives), the dissemination of existing information (the University Library and the University Image Centre) were all brought together under one administrative umbrella.

Initially this move would have seemed unremarkable, and possibly not even revolutionary. However it did become so, with the University of Calgary Press as the first agent of change. The University of Calgary Press was small with approximately a 156-title backlist, and an annual production of eight to ten titles on general topics. It had no real focus.[13] After careful reflection the management of the press decided that their interest should be more confined – to the heart of the North American continent particularly its history, its environment and its Aboriginal peoples. The argument was that if the University of Calgary Press did not assume responsibility for this region no one else would. With renewed focus, the press began to solicit manuscripts and within eighteen months of change of focus, the inventory of ten manuscripts grew to over sixty. Regional scholars long frustrated at being ignored by large academic presses, found a real outlet for their research. The press quickly provided a vehicle for the voices of women, Aboriginal peoples, and immigrants. All sought legitimacy and the validation that could be provided by a scholarly press rooted in their University.

There were other ways the University's press contributed to shoring up the foundation of eroding community cultures based in languages other than English. Alberta's unique primary collections are distributed amongst three or four large institutions at significant distances from each other and even greater distances from the many rural Albertan communities. The solution was based on technology – a digital Alberta archives and library aimed at Albertans no matter where they were. It would contain every local history, the homestead files (a symbol of first contact with the land), all local newspapers since their first printing, photographs, folklore archives, and Western Canadian art. The outcome of this project is not yet known since it is a work progress, however the results are promising.[14] The interest by communities in their past and their eagerness to have their local resources on the University Press Web became apparent as soon as we approached historians, genealogists and historical societies for copyright permissions. By being central to a University project, these communities felt and indeed have had their soul and past validated. The issue now will be what the press does with the increasing offerings of manuscripts, photographs and books that the communities are beginning to offer. The option of persuading donations to the "old" style archives may not be accepted by the communities. Some believe that the "old" archives hid their past, and that the new digital archives on the Web will liberate it.

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[13] Http://www.ucalgary.ca/UofC/departments/UP

Why? First, because the University is reproducing the communities' documents in whole without any intervention, summation or context. These communities are now part of the new global village. They can rekindle an interest in their past on their own terms. They no longer have to go a government-run institution, the Provincial Archives in Edmonton, or to a high-end privately run museum ultimately controlled by government. All evidence of their past that can be legally reproduced is available. Their past is the world's past.

This "digital" archive was made a project of the University of Calgary Press to ensure that the collections meet "academic" standards associated with refereed publications of primary sources. The intention is not to collect arbitrarily, but rather to provide existing primary materials in digital form based on long standing traditions of primary source publication. Integrity of the document must be paramount. There will be no interpretation. That will be up to the individual user. However, there is pressure beginning to build for the University to acquire a "literary" press that would be an outlet for the creativity of its students, faculty and community. There is a growing faith that many of the regional writers are amongst the best, and that it is the responsibility of the University of assist in their nurture.

While the press has become a focus for regional cultural renewal, the University's own archives are also "being" discovered. The Canadian Architectural Archives, the leading

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[14] Http://www.millennium.gc.ca/cgi-bin/mill_srch.cgi?view_record_e&566

Canadian repository in this field, has just received University permission to begin a major fund raising campaign to encourage research, to conserve, and to add to the collection. The participation of the Nation, rather than region, in the archives has legitimised the University's national responsibilities in this field. The same is true of the "literary" archives, which also has a Canada-wide focus.

As smaller Universities develop niche or "boutique" collections with national roots albeit with a regional flavour, the regions will become stronger players in their nation's endeavours. It will also ensure that university information resource centres do not become little more than dollar aggregators for major information monopolies. If these university libraries do not focus on their unique regional collections and spend significant dollars building and making them accessible, they and their cultural contexts will vanish.

However, community information literacy issues, the technological capacity of individual users within the community particularly rural Alberta, and the strong attraction of internationalised search engines, makes the success of these initiatives less than assured amongst marginalised regions and peoples, particularly Alberta's Aboriginal communities. If in the past the book whether by an archaeologist, an historian, or an anthropologist supplanted traditional knowledge of the elders, now it is the Internet. The machine has replaced tradition. While in some cases the Internet has provided the ability for disparate communities to come together through chat lines and e-mail – there has been little evidence yet that this is happening in the Aboriginal communities in Western Canada. In a society where elders are respected, where communication and status is often determined by spatial rather than verbal considerations, and where the sharing of information has roots in ceremony, the Internet can only serve to alter existing paradigms of community interactions. The addiction to the new technologies by the young people is unavoidable. How can the new technologies be used to nurture a community so that it can determine its own rate of change within its cherished values?

There is however hope. A few Aboriginal communities have developed their own Web Sites, however few are heavy with content, and most remain little more than painful gestures of dying cultures. There are opportunities to use the Internet to advance the interests of Aboriginal Communities. Some opportunities are already unfolding in Southern Alberta. The relationship of people to land, and people to the heavens is at the root of Blackfoot folklore. While much of that folklore has been lost, much is replicated in the writings of early folklorists and anthropologists. The digitisation of these texts allows teachers and those interested in cultural revival to have ready access to these stories for inclusion in the school curriculum, and indeed to put them on the Web in the language of children - unfortunately English. This has already happened particularly amongst the Cree and the Dene, although the impacts have not been assessed. This would be an incredible validation of Aboriginal culture by modern information technology especially if in indigenous languages. The new technologies will shortly permit the video streaming of elders' images, accompanied by language and folk tales in first languages. But poverty will mitigate any wide spread impact.

The issue becomes not the technology or its capacities, but the willingness of the dollar aggregators, the academic libraries, the government, and even business to ensure the longer-term survival of regional culture. University libraries have been for some time the most important aggregators of the information dollar. It can be argued that many of the information monopolies are creating high-end product solely for the university market. Surely, if this is the case the university libraries have to begin to view their broader responsibilities as cultural instruments. Yes, governments are increasingly playing a role in determining the placement of cultural material on the Web. However government content is often lacking in rigor and transparency, and is often directed in message. While business and business-supported foundations have been extremely generous, their own efforts at internationalisation in support of globalisation and "progress" make them less than creditable. The only way for regional information and its living cultural context to flourish in the digital age is if the academic libraries and their imprint arms become more holistic in their approach and realise their role in the validation of their host cultures. This does not denigrate importance of seeking validation for their scholarly efforts by their English/American international "betters" and "peers." Universities unconsciously fed the creation of the information monopolies, now they can consciously provide the lifelines for regional cultures.

## REFERENCE

- Foster, George M., (1973). *Traditional Societies and Technological Change*. New York: Harper and Row, 1973
- Hills, Gordon., (1997). *Native Libraries Cross-Cultural Conditions in the Circumpolar North*. London: The Scarecrow Press.
- Mesthene, Emmanuel G., (1971). *Technological Change: Its Impact on Man and Society*. Cambridge: Harvard University Press.
- Stock, Gregory, (1993). *Metaman*. London: Bantam Press.
- Thrall Charles A and Jerold M. Starr eds., (1972). *Technology, Power, and Social Change* Toronto: Lexington Books.

- University of Calgary, (1998). *Library of the Future Taskforce*. Calgary: Information Resources.

ARTICLES

- Blanchette, Judith, (1996). "The Culture of Computer Technology in Education and Research: A Canadian Perspective". *Paper presented at the Standing Conference on University Teaching and Research in the Education of Adults*. Leeds: England.
- Calliabetsou, Penelope., (1993). "The Role of Educational Technology, Verbo-Visual Literacy: Understanding and Applying New Educational Communication Media Technologies". *Selected Readings from the Symposium of the International Visual Literacy Association*. Delphi: Greece, June 25-29, p 223-226.
- De Gennaro, Richard, (1987). "Libraries, Technology, and the Information Market Place", *Selected Papers*. Boston: G.K. Hall and Co..
- Hallam, Emma and Murray, I.R. (1998). "World Wide Web Community Networks and the Voluntary Sector", *The Electronic Library*, Vol. 16, No. 3, June, p. 183 – 189.
- Howland, Joan Sidney., (1998). "The "Digital Divide: Are we becoming a world of technological haves and have-nots?", *The Electronic Library*, Vol. 16, No. 5, October, pp. 287-289
- "Internet Communities Forget Surfers. A new class of Netizen is settlin right in" *Newsweek* at http://www.businessweek.com/1997/18/b35251.htm
- Khurfshid, Zahiruddin, (1998). "System migration: challenges for libraries in the Arabian Gulf region", *The Electronic Library*, Vol. 16, No. 3, June, pp. 171-174.
- Stalder, Felix, Beyond Portals and Gifts Towards a Bottom-Up Net-Economy, First *Monday* at http://www.firstmonday.dk/issues/issue4_/sstalder/

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## Crossroads of the New Millennium

# Education Between Globalisation And Local Culture: A World Without Frontiers For Students Without Traditions?

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# Abstract

Bringing an anthropological perspective to bear on the issue of globalisation and its impact on education, this paper argues that globalisation should not be regarded as a top-down development only, one that gives global organisations and businesses the power to redefine national and local customs and traditions. More appropriately, globalisation should be seen as a process that requires active adaptation and assimilation on the national and local levels, resulting in hybridisation and the spread of cultural diversity. In the realm of education in the Arab world (and beyond), we note a Westernisation of educational structures and philosophies, especially among the socio-economic elites, who sent their children to foreign language schools and universities. The "dangers of deculturalisation" and the education of a generation of "strangers" in their own country has been bemoaned by adult analysts. However, even international schools cannot transcent their local and national environments, which formulate the "hidden curriculum" for student learning. In addition, students appropriate foreign cultural forms in context-specific ways, which makes them creators of a new culture.

# Education between Globalisation and Local Culture: a World Without Frontiers for Students Without Traditions?

It is the purpose of this paper to bring an anthropological lens to bear on the intersection of three seemingly divergent and contradictory forces: globalisation, local culture, and education. Beginning with a definition of the three terms, the paper gives a brief overview of the relevant literature on globalism as threatening or promising force. The subsequent section explains anthropological method and usefulness in the study of the challenges that educators and students face in the new millennium, followed by brief case scenarios. Based on field research in Lebanon, where I worked as a high school teacher in an international school, 1997-98, my findings show how students perceive, negotiate and appropriate the divergent forces in their everyday lives, as they move through different "continua of cultural space" (Fernandez 1986). It is my contention that the intersection of the global and the local in the life of school-age teenagers can result in creative culture production: students use global vocabulary in formulating meanings and commentaries about the world around them. In the process, they localise the global.

## GLOBALISATION VERSUS LOCAL CULTURE: AN UNFAIR COMPETITION?

Globalisation, a term that appeared in the English language dictionary for the first time in 1961, has been defined "the process of increasing interconnectedness between societies such that events in one part of the world more and more have effects on peoples and societies far away" (Baylis and Smith 1997: 7, 14). The fact that the world is interconnected is not a late twentieth century discovery: trade links between communities have been the norm ever since communities organised themselves into socio-political entities.[1] However, the process of globalisation is a qualitatively new phenomenon, as "social relations acquire relative distanceless and borderless qualities, so that human lives are increasingly played out in the world as a single place" (Scholte 1997:14). What transforms the world into a visibly singular place has to do with worldwide patterns of production and consumption. Agents of globalisation are multi-national corporations and international organisations, and their goal is an uninterrupted flow of goods and information, as diverse as CNN news, McDonald's hamburgers, Hollywood movies, Nike shoes, investment money, or World Bank loans. As this list indicates, most of the products originate in the United States, although many of the component parts are produced and assembled elsewhere. What makes us feel global are images of foreign countries that look like home, as well as the immediacy of reaching friends, family, or business partners around the world via telecommunications devices. A fax sent from the United States reaches the United Arab Emirates before I can take it to my next-door neighbor. Globalisation, in addition to its distanceless and borderless qualities, collapses time: our actions are instantaneous. We have forgotten what it means to wait for a letter to arrive.

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[1] It has been argued that the emergence of organised communities has been an outcome of travel and trade links. For instance, Clifford states, "Cultural centres, discrete regions and territories, do not exist prior to contacts, but are sustained through them, appropriating and disciplining the restless movement of people and things" (1997:3).

Exactly these three characteristics -- distance, borders, and time -- pertain to our understanding of local culture, which can be defined as "the experience of everyday life as lived by ordinary people in specific localities" (Watson 1997: 9). This experience of everyday life is a space of relative homogeneity, where individuals subscribe to, or at least recognise, common tenets of child-rearing practices, education, marriage rules, life stage ceremonies, morals or values. Local culture is never uniform, as personal status and gender, as well as ethnic, professional, and other stratifications result in different degrees of involvement in communal activities. However, if asked to identify the most prominent features of their community, most members would be in agreement on the rituals and practices, despite their individual opinions about them. A local culture requires boundaries that set it apart from others. Boundaries are often drawn via marriage or trade rules, in addition to fences and actual border crossings. The borders set up spatial, and, more importantly, cognitive distance between peoples; it is not necessary for a person to live across a fenced border to be considered "different" or "other." Sometimes, a person can live in the same household, but still be considered an outsider. The third element that defines local culture is a specific sense of time. The understanding of the past is arranged differently in diverse locales, allowing for unique origin myths, ancestors and genealogies, important historical battles and victories, which result in stories that members of a community share. It is through these stories that communal sentiments get established. As the elders tell children about their ancestral heroes, or as they organise commemorative festivals and rituals, sentiments of group cohesion and membership are constituted.

According to these definitions, globalisation and local culture seem to be diametrically opposed forces, the first resembling a forceful stream intend on flooding the second, rendering it unrecognisable. Local cultures, in this image, are lowlands whose protecting dikes are increasingly demolished. Indeed, it has been argued, that globalisation will profoundly change the way individuals, communities, and nations interact (cf. Reich 1991; Waters 1995). As early as 1964, with the onset of the technological revolution of the twentieth century, McLuhan warned of the pernicious effects of the innovations that were entering everyday life, comparing the rapid introduction of new media and technology in our lives to "huge collective surgery carried out on the social body with complete disregard for antiseptics" (McLuhan 1964: 64).

But is the story really that simple? Lately, it has been discovered by anthropologists, who are the experts in small-scale community studies that the local is not about to disappear as the gloomy predictions of the past had said (cf. Appadurai 1996; Hall 1991). Global forces have to undergo a "localisation process" before they are accepted into the community. In other words, our simplistic picture of globalisation needs refinement. While there are certainly global changes, which dictate, to a certain degree, what people wear, eat, read, and watch, a fine-tuning of our analytical lenses can reveal a more nuanced picture of processes of hybridisation, instead of homogenisation. People choose to accept or reject global goods and ideas, following their own, culture-specific agendas.

## EDUCATION: STANDING ON UNEASY MIDDLE GROUND

Education in its current version of student enrollment in subsequent grades of educational institutions can be defined as modernist project. As a byproduct of industrialisation and nationalism, schooling superseded previous methods of teaching, for instance, the apprentice system or age group initiations. The governments of new European nation-states appropriated the educational enterprise as a tool of homogenising, integrating and controlling the populace, turning them into citizens who knew and followed the laws, entered the work force in an orderly fashion, and joined the military if called to defend the country (Gellner 1983; Green 1997: 131-136). The new education system was then exported, in the wake of colonial governments, to all parts of the world, where it was actively embraced as means to economic growth and development (Christina, Mehran, and Mir 1999: 347). At the present, the differentiation of education into primary, intermediate and secondary schooling, to be followed by higher education on the university level has become a universal classification system. The idea of testing and grading are also universal, as are, from the student perspective, the fears of failing. This strictly regulated education program is closely linked to national policy-making, and the ministries of education worldwide are entrusted with the task of producing skilled, knowledgeable citizens, who will dutifully participate in national economic, political, and cultural pursuits. Education thus defined is uneasily lodged between the forces of globalisation and local culture, as it wants to shield itself against the former, and dominate the latter.

It is not without irony that national education at the turn of the millennium faces a similar conundrum as local cultures have throughout most of the past century, after governments decided to turn education into a "massive engine of [national] integration" (Green 1997: 134). There is no denying that the role of education, or, more specifically, the adult expectation of what education is supposed to accomplish, has been affected by global developments. Whereas education in the past was a means to acquire the father's trade, or a specific body of knowledge, education has become the instrument to hone professional skills. Globally, parents want their children to become doctors, engineers, lawyers, and business people, and schooling is considered to be a guarantee for financial security. Not without reason do parents tell their children to take school seriously, as it is their "investment in the future." Education has become a commodity in the global market system, which is most obvious among the upper socio-economic classes. Parents are willing to pay substantial tuition fees to ensure their children's access to social networks and quality teaching which will lead to "success," defined in monetary terms. Today's high-paying jobs require international travel and communications, and an awareness of technological advances and their application in the work place. Thus, education loses its role as national integration machine, and becomes a derivative of global market needs, which are English-based, de-territorialised, reliant on analytical skill, problem-solving capabilities, and the dexterity to react to constant flux and change.

## THE END OF LOCAL CULTURE? STUDYING THE ISSUE THE ANTHROPOLOGICAL WAY

While globalisation's impact on education cannot be denied, it is not entirely clear how globalised education impacts local cultures. If we believe scholars like Waters, who stipulates that the "determining principle of culture is the medium by which it is transmitted," we might well expect an end of local culture (1995:34). With the revolution in communications technology, and the daily use of the internet, cable TV, beepers, cell phones, faxes, e-mail, etc., local cultures seem to face fundamental transformations. We can (and usually do) evaluate these developments in two ways:

1. We regret that people have begun to consume identical goods all over the world and spend more time with electrical appliances than with other human beings, while 2) we hope that the communications revolution will bring the world closer together to form a "global village" of shared values and ideas. On the other hand, we can turn to anthropologists like Appadurai, who claims that "globalisation is not the story of cultural homogenisation" (1996:11). He argues that very few cultures can lay claim to uncontaminated authenticity, since culture contact was the norm across the ages, and not the exception. Coining the terms "technoscape" and "mediascape," he then describes how new media and technology enable communities to preserve local culture across boarders, as migration, displacement, and diaspora increasingly become shared human experiences. For Appadurai, position 1) is not to regret, but to welcome the technological innovations, which allow for building and maintaining communities across long distances. As for position
2. Homogenisation of values is considered to be impossible: rather than creating a unified global culture, media and technology promote trans-local communities.

In order to substantiate their claims, anthropologists use oral or textual ethnographic evidence, collected by conducting "participant observation," which means spending a year or more among a chosen community to see and partake in their daily routines. In my case, it meant settling in the "Westernised" part of Beirut, called Ras Beirut, which is home to the American University, as well as a few foreign language private schools. From all the individual neighborhoods in the city, Ras Beirut is a prime example of hybrid local culture. Stores, restaurants, and billboards cater to a bilingual clientele, as Western fast food chains line the street closest to campus, alongside more traditional *falafel* and *manaouche* stores. People speak Arabic and English, code-switching at ease, as they talk into cell phones, eat a *quick lunch, or* chat with friends on the sidewalk.[2] Ras Beirut, I was told repeatedly, was not typically Lebanese, which made it a perfect research site for questions regarding an endangered local culture demolished by the global. In such terrain, I should not be able to find many traces of "Lebaneseness."

I taught and spend time with Lebanese teenagers and their families, who had returned to the country after the civil war ended in 1991. After spending a considerable part of their young lives abroad, mostly in international schools, these young Lebanese are prime informants on issues of globalisation, education, and local culture. Having returned to a country they are expected to consider "home," these students are self-consciously engaged in "becoming Lebanese" within and against their international upbringing and, in some cases, many cross-border moves. In their position as "outsiders," they vocally and critically comment on the different local and national socio-political structures and events, which define their daily lives. What follows are two case scenarios to illustrate the kinds of behaviour and opinions I encountered among young Beirutis in the classroom and in more informal setting around the school.[3] I hope to show that Lebanese students are adept in categorising different zones of cultural influence, using their knowledge and mastery of global culture as a way to express their local concerns.

## SURFING THE INTERNET: LOCAL USES AND ABUSES OF GLOBAL TECHNOLOGY

One day after class, Ahmed tells me, interrupted by bursts of laughter, how he "met" a vampire in a chat room, someone who claims to be 3000 years old, yet only 34 in his current lifetime, and who has the gift of giving eternal life. Ahmed was one of my students in Beirut, who spent much of his free time "chatting" on the internet. Of course, he clarifies right away, he mostly uses the computer to e-mail his friends abroad, and he has many as he lived in Saudi Arabia and the United States before returning to Lebanon with his parents and siblings. Ahmed also uses the internet to do his homework assignments. One week, I assigned a research project on presidents of different Arab countries, and Ahmed brought me a several page long essay on Ghaddafi. Since he had not bothered to reformat the margins, I could easily identify the source of his "work," and called him on it. This was not the research project I had had in mind. "But Miss, we don't have up-to-date books in our library here, I had to go to the web! And it took me hours to find this one site. There is soooo much stuff on that guy...." Looking at it this way, Ahmed had done research, just not book research. I asked the rest of the class who had used the computer for the assignment, and more than half of the students raised their hands. "Miss, books are outdated."

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[2] Traditionally, language and culture have been seen as synonymous phenomena, as the former was thought to express the latter. This view is reflected in the plea for Arabisation in Middle Eastern schools (cf. Massialas and Jarrar 1991). However, in light of the realities of migration, displacement, travel, and commercial exchanges across borders, culture has become more detached from language concerns.

[3] In my work, I assume education takes place inside and outside of classrooms: the time spent with peers has as much, if not more, influence on teenagers, than the time spent with teachers. I therefore privilege the informal over the formal education setting in this short paper. For more classroom examples, please consult my forthcoming dissertation (Volk 2000).

It has been argued that since students today spent many hours daily using new communication technology, a significant part of their learning takes place in front of a screen (Gopnik 1999). And as teachers were commenting, when I brought up the topic in the teachers' lounge, at least students are reading as the internet keeps them interactive. This was seen as an improvement over TV. That evening, I drew up a short questionnaire, asking how many hours a day students spent with their computers, TV, or reading.[4] It turns out that students who own a computer play computer games daily, either alone, or with friends. Almost all of the students, however, use e-mail several times a week, those without computer access at home going to one of the many internet cafés. They were mostly e-mailing friends or family abroad. Hasan, for instance, came up after class to tell me that an uncle of his had compiled all of their family members' e-mail addresses into one big address list, and as a consequence, he was receiving up eighty messages a day, "Eighty messages, Miss!", from his extended family all over the globe. He said, even his parents were spending hours on the computer these days, replying to the incoming messages. Which is why the house's phone lines were continuously tied up. So the only way he could communicate with his friends in Beirut was via his cell phone. Which he also used to send e-mail messages.

Rula spends much of her allowance and free time on chat lines in the Web Café next to the American University. She says, she loves to meet new people that way. Depending on the time of day, she will connect with Australians, Europeans, Americans. People identify themselves by their real or made up names, which they use continually. Rula has become a "regular" in a chat group. "I meet a lot of freaks, of course, but I just don't reply." She says that once she tells the chat group that she is Lebanese, she will often get inquiries if she looks like the TV announcers on LBC International, a Lebanese TV station which broadcasts to other Arab countries. She says, she does not respond to those messages. She vividly remembers the time when she was in a chat room and found out that one of the group was Israeli. So she re-logged herself into the chat room as "terrorist" and got into an argument about Arab-Israeli politics. "Miss, you had just taught us about the White Papers and stuff, so I had to show off what I had learned!" Rula smiled. "In the end, I had half the customers at Web Café stand around my terminal participating in the debate. That was fun!"

Ahmed complained to me another day that his friends were using e-mail too much. "I run into them on the street, and they ask me, 'Did you read my e-mail yet?' Instead of just saying it right there." Somewhat annoyed, he then has to go to his computer to find out what his friends wanted to say. Indeed, his patterns of social interaction have changed dramatically ever since he got his own cell phone and his computer station in his room. But the different uses of the internet by different students makes it hard to come to generalisations about how internet culture has affected "Lebaneseness" or local life. Students make use of the internet to complete homework assignments, learning to navigate the global information highway, while finding shortcuts to completing assignments. They talk with strangers, freaks and vampires, but they also stay in touch with relatives abroad. They get to know people elsewhere and tell them about Lebanon. In conversations with students, I got the sense that they see the internet as a tool of entertainment as well as learning. Does this pose a challenge to classroom teaching styles? Indeed. Does it abolish the local? Not necessarily. By logging in as "terrorist," my student ironically mirrored the Western media depiction of Arabs, localising her identity to initiate an internet discussion. Most of the internet encounters

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[4] Consult my forthcoming dissertation for a detailed evaluation of the answers. Usually, the TV was on all day long in the family living room, and students tuned in and out as they were doing their homework. Reading

become funny stories to share with friends locally. In most e-mail cases, messages are sent to inform the recipient of personal and local news. With so many Lebanese living all over the globe, the internet becomes a techno-scape that allows for regular communication.[5]

## POP CULTURE LOCALISED: SECTARIAN SENSITIVITIES AND RAP

In their senior year, a group of students started the WSDC, the West Side Druze Connection. Already a group of friends, not all of them Druze, they assumed a *nom de guerre* that indexed the American rap artist Tupac Shakur, who was killed in 1996. Based in California, Tupac Shakur had been in competition with East Coast rap artist Notorious B.I.G., who got killed in 1997. The two singers represented the East Coast and West Coast camp of American rap artists. They fought for years over which side played the most authentic rap, who of the two was more "down," which means grassroots, black. "It's all about the West Side" or "East Side" became part of the rap lyrics and the vocabulary of their respective fans. When both artists were killed (by still unknown killers) the public declared them victims of the West Side-East Side war. Other rap artists began to call for a "truce" and the mothers of both victims met in a much publicised reconciliation meeting. In 1998 Beirut, according to my student Nabil, it was the Druze "who thought they had a connection with the West Side." Their "enemies" were the members of the MP, *Mesihi* [Christian] Power.

The part of Lebanon's civil war that was fought in Beirut was a war between Christian neighborhoods in East Beirut and Muslim neighborhoods in the West, which then became a metaphor for the entire civil war. Mapping the conflict between Tupac and Notorious B.I.G. over authenticity of rap onto the Lebanese civil war, the students replayed their own country's sectarian conflict with the vocabulary of popular international culture. Just as Tupac and Notorious B.I.G. showed disrespect to each other in their songs, the students made fun of each other's sectarian particularisms. Nabil explains:

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books, magazines, or newspapers took a distant third place.

[5] Of course, the internet has a price. Web Cafés charge between US$ 3 and 6 an hour, phone bills can amount to US$ 300 a month if several family members use the net. Which means that only a certain class of people makes use of this tool of global culture.

> "so everybody that was Druze would get on the case of people who were the Mesihi Power... everyone who was Christian got MP written on their locker and Muslims got the WSDC sign. And the Druze would put chips in the Christian lockers, you know, like when you go to church, you get the Eucharist, so they were kind of saying, oh, you're getting *Fantasia* at church, like the cheap Lebanese chips. And we'd say, oh, the United Colors of Benetton, cause they got their five color star [a Druze religious symbol], like you don't know anything about your religion.... it was all these dumb jokes.... "

While the West Side-East Side scenario was a way of recontextualising and distancing themselves from "Lebanese reality," their joking practices were unmistakably close to home. Dropping chips in lockers, or referring to religious symbols, the students were not just clowning around. This was all about whose side you were on. But Nabil reassured me several times, "Miss it was a joke! We'd do it to someone and then laugh about it together and we'd all be going to class. Nobody took it seriously. We just had fun." Lama commented, "Miss, these guys are just so immature." Nabil retorted," Come on Lama, you were laughing too, at the time." Lama concedes, smiling. Nabil turned to me again, saying, "And you know, Miss, at other schools, they take this stuff seriously. We were just joking."

The joking mode, as well as the rap conflict mimicry, constituted a frame of reference that granted the students immunity from criticism or punishment. Using the East Side-West Side conflict of rappers, the students formulated a blunt and biting commentary of Lebanese sectarian particularism, a commentary about dying for your side in a meaningless act of violence. They do so at a time when adults are silent about the war, when they say, "*Khalasnaa min l-harb*" [we left the war behind], meaning that they want to move on with their lives. On the other hand, the students are able to express their concerns about the world around them. They do it at a time when the government optimistically espouses new solidarity among the Lebanese. But the students point out the cracks in the optimistic discourse of reconstruction of their elders. In the space of ambiguity opened by the joke, they affirm that much is left unsaid and unsettled in post-war Lebanon.

## CONCLUSION

Living in a country under reconstruction, facing political and economic uncertainties, and having to claim a national identity that they, for the most part, did not grow up with, young returnee Lebanese have a difficult task ahead of them. Being labeled "you're not pure Lebanese" by peers who stayed in the country during the war, my students used tools and content of global culture, to express their local concerns, and fulfill local expectations. In my classroom, I had several discussion with my students about the effect that their foreign language education has on their "Lebaneseness," which, in each case, sparked a fierce debate between the "functionalists," who considered an English language education instrumental to their future career opportunities, and the "traditionalists" who believed it endangered a rooted sense of self. The discussion often ended with accusations back and forth about who ate burgers and who ate *manaouche* for lunch. In other words, the students implicitly stipulated that culture is based on the choices individuals make. And they sometimes choose traditional and sometimes foreign foods in the school cafeteria, placing their order half in English, half in Lebanese Arabic; they use e-mail to reconnect with family or to reach out to unknown audiences, they spend weekends with friends in pubs in Beirut, or with family in their mountain homes. This does not mean that the students are confused or conflicted. It means that they take their local culture into the global arena. In the process, they create their own Beiruti post-war youth culture.

## REFERENCES

- Appadurai, Arjun, (1996). *Modernity at Large: Cultural Dimensions of Globalisation.* Minneapolis: University of Minnesota Press.
- Baylis, John, and Steve Smith, (1997). *The Globalisation of World Politics: An*
- *Introduction to International Relations.* Oxford: Oxford University Press.
- Christina, Rachel, Golnar Mehran, and Shabana Mir, (1999). “Education in the Middle East: Challenges and Opportunities”. In *Comparative Education:* The Dialectic of the Global and the Local. R. F. Arnove and C. A. Torres, eds. pp. 345-370. New York: Rowman and Littlefield Publishers, Inc.
- Clifford, James, (1997). *Routes: Travel and Translation in the Late Twentieth Century.* Cambridge, MA: Harvard University Press.

- Fernandez, James W., (1986). *Persuasions and Performances: The Play of Tropes in Culture. Bloomington*: Indiana University Press.
- Gellner, Ernest (1983). *Nations and Nationalism. Ithaca*, NY: Cornell University Press.
- Gopnik, Adam, (1999). "The Return of the Word". In *The New Yorker*. pp. 49-50.
- Green, Andy, (1997). *Education, Globalisation, and the Nation State*. New York: St. Martin's Press, Inc.
- Hall, Stuart, (1991). "The Local and the Global: Globalisation and Ethnicity". In *Culture, Globalisation, and the World-System*. A. King, ed. pp. 19-40. Binghamton: State University of New York.
- Massialas, Byron G. and Samir Ahmad Jarrar, (1991). *Arab Education in Transition: A Source Book*. New York and London: Garland Publishing, Inc.
- McLuhan, Marshall, (1964). *Understanding Media: The Extensions of Man*. New York: McGraw-Hill Book Company.
- Reed-Danahay, Deborah, (1996). *Education and Identity in Rural France: The Politics of Schooling*. Cambridge: Cambridge University Press.
- Reich, Robert B., (1991). *The Work of Nations: Preparing Ourselves for 21st-century Capitalism*. New York: A.A. Knopf.
- Scholte, Jan Aart, (1997). "The Globalisation of World Politics". In *The Globalisation of World Politics: An Introduction to International Relations*. J. Baylis and S. Smith, eds. pp. 13-28. Oxford: Oxford University Press.
- Volk, Lucia, (2000). "Missing the Nation: Lebanon's post-war generation in the midst of reconstruction". *PhD Dissertation* submitted to the departments of Anthropology and Middle Eastern Studies, Harvard University. (forthcoming)
- Waters, Malcolm, (1995). *Globalisation*. London: *Routledge*.
- Watson, James L., (1997). *Golden Arches East: McDonald's in East Asia. Stanford*, CA: Stanford University Press.

TEND 2000

## Crossroads of the New Millennium

# Lifelong Learning For The Global Networked Society

Prepared and Presented

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Workshop 2

# Abstract

Professionals have normally become qualified as a result of a period of formal education followed by, or integrated with, structured training. They have then followed this initial formation stage with continuing professional development. We are however beginning to see a breaking-down of this traditional pattern and its replacement with a process of lifelong learning undertaken in a variety of ways. The development and application of a wide range of information and communications technologies means that people can learn where, when, what and how they want. In addition the focus of learning is moving away from the teacher and towards the learner.

These changes in the structure of learning are being accompanied by changes in the patterns of work. No longer can a person be guaranteed a job for life and indeed the very concept of the 'job' is being called into question. The emphasis now is on flexibility and portfolio careers, where the individual develops a range of knowledge, skills and understanding to apply to new situations as they arise. This paper considers these changing patterns of work and learning and explores how they are forming the basis of a newly emerging global networked society.

# Lifelong Learning for the Global Networked Society

> ***Just as the whole world is a school for the whole of the human race, from the beginning of time until the very end, so the whole of a person's life is a school for every one of us, from the cradle to the grave. It is no longer enough to say with Seneca: "no age is too late to begin learning." We must say: "every age is destined for learning, nor is a person given other goals in learning than in life itself."***
>
> *- Jan Comenius (1592-1670)*

Professionals have normally become qualified as a result of a period of formal education followed by, or integrated with, a structured training programme. They have then followed this initial formation stage with continuing professional development (CPD). We are however beginning to see a breaking-down of this traditional pattern and its replacement with a process of lifelong learning. Such learning is formal, non-formal and informal and undertaken in a variety of ways. The development and application of a wide range of information and communications technologies (ICT) means that people can learn where, when, what and how they want. In addition the focus of learning is moving away from the teacher and towards the learner.

These changes in the structure of learning are being accompanied by changes in the patterns of work. No longer can a person be guaranteed a job for life and indeed the very concept of the 'job' is being called into question. The emphasis now is on flexibility and portfolio careers, where the individual develops a range of knowledge, skills and understanding to apply to new situations as they arise. The convergence of learning and work is seen in the concept of the learning organisation and other forms of learning community such as the learning city. Societies, along with work and learning, are becoming more and more globalised, and individuals are increasingly regarding themselves as members of a number of inter-relating networks.

In this paper, which provides background for a TEND 2000 workshop, I consider the changing patterns of work and learning. During the workshop I will explore with the participants how these changing patterns are forming the basis of a newly emerging global networked society and discuss possible scenarios for the future.

## SOME HISTORY

In the space of just a few centuries the world has witnessed huge transformations. In some parts of the world we have seen agricultural societies come and go and industrial societies, as well as service societies, taking their place. In other parts these three types of society continue to co-exist. But the most dramatic change has been the growth of the knowledge-based society, or learning society, which is truly global in nature and which has powerful implications for the ways in which we learn and work. For some people the learning society feels uncomfortable, undermining their sense of security, but to my mind it should be a source of optimism, bringing with it the possibility of enabling each one of us to develop our full potential and play our part as global citizens. Certainly we will go on tending the land, producing goods and supplying services, but our ideas of work and its purpose will be radically changed. "In a technologically advanced society where production of sufficient goods and services can be handled with ease, employment exists primarily for self-development, and is only secondarily concerned with the production of goods and services" (Harman and Hormann, 1990).

## CONTINUING PROFESSIONAL DEVELOPMENT

To help us clarify such a vision let us first take a look at CPD. It can sometimes seem that there are as many definitions of CPD as there are professional institutions encouraging their members to participate in it. We all think we know what the words 'continuing', 'professional' and 'development' mean until we come to define them. When we do finally arrive at definitions the meanings of the words seem to change as we put them together to make the phrase. For example: Does 'continuing' mean throughout life or from the end of initial education and training? Is 'professional' solely job- or career-related, what happens if we do a number of different jobs and have a range of careers, and what actually distinguishes a professional from a non-professional? Does our 'development' have an end point during our life or is it an on-going process?

The Institute of Continuing Professional Development (ICPD) was launched in the United Kingdom in 1998 with the purpose of raising the effectiveness of professionals and professional organisations by the establishment of a set of standards relating to CPD. Here is one definition given by the Institute:

> *CPD is the systematic maintenance, improvement and broadening of knowledge and the development of personal qualities necessary for the education of professional and technical duties throughout the practitioner's working life.*

This can at least be a working definition even if we accept, as the ICPD itself does, that it does not tell the whole story. From the perspective of professional bodies it is perhaps surprising still to hear debates about whether CPD should be optional or mandatory. Surely we need to practise CPD just in order to keep up with changes in our working lives let alone to keep ahead of them. One problem arises from the fact that we need to conceptualise CPD, thereby making it sound something special or separate from what we are doing anyway. Professional bodies can make CPD seem like a product that they are trying to force on their members.

This problem is compounded when the institutions try to quantify CPD in order to incorporate it into their membership requirements. How can it properly be measured by points or number of hours? Does attending a lecture contribute to our recognised CPD? What if we were asleep throughout? How about that book on memory techniques I read during the lunch-hour, the content of which I can't quite recall? If we are serious about measurement and assessment we need to find effective ways of measuring and assessing what has been learned but, as we all know, this is not easy.

## TOWARDS LIFELONG LEARNING

I believe it helps to switch the focus from a concept having its origins in the world of professional membership to one relating more to all aspects of our life: lifelong learning. Harman and Hormann again: "Finally, the old concept of education as job preparation is totally unsatisfactory from both the standpoints of the individual and society. For a host of reasons, lifelong learning is the only kind of education that makes sense. Thus, the workplace can also be considered as a learning place." So the concept of lifelong learning seems to have a clearer, more uncompromising meaning, certainly for the times in which we now live, and it relates to our personal as well as our professional development.

We cannot be certain of a job for life, but what is certain is that we will need to be prepared for job changes and for utilising new skills and knowledge at increasingly frequent intervals. More than that, the very nature of work and what it means to be employed is changing. Looking at developments in the Western world, the quantum physicist, David Bohm (quoted in Kofman and Senge, 1995), says, "Starting with the agricultural revolution, and continuing through the industrial revolution, increasing fragmentation in the social order has produced a progressive fragmentation of our thought." This fragmented way of thinking - breaking things down into their component parts - allowed Henry Ford, using Frederick Taylor's theories, to deconstruct work processes and produce more cars more economically. The learning society, by contrast, is based on the primacy of the whole, not the parts. We see this in new organisational structures based on a systems approach where, for example, job-specific hierarchies give way to multi-functional teams or networks and where work is more than simply a way of earning. "The defining characteristic of a system is that it *cannot* be understood as a function of its isolated components" (Kofman and Senge, 1995).

## THE NEW WORLD OF WORK

New structures of work, learning and thought are needed to cope with a world, which is becoming increasingly chaotic and unpredictable. Consider just some of the ways in which the world is changing. We can now insert a piece of plastic into a hole in the wall almost anywhere in the world and get money from our bank account. Soon we will be able to top up our electronic purse with money from our account via our personal computer. Of course our bank might actually be a supermarket, where in the near future we will be able to buy gas and electricity using our smart card, which will also register the credits in our learning account.

So the supermarket is no longer just a supermarket and our money is no longer recognisable as money. Also it seems unlikely that individuals will continue to have single jobs or roles. Statements such as I am an engineer, I am a welder, I am a banker, I am an architect will, I predict, seem very antiquated before too long. As Alan Briskin (1998) points out, "Role is a mental construct that is fluid and constantly changing because the world around us is also dynamic and constantly changing." Multi-skilling is one of the buzzwords. Multi-employers might be another, but why stop there, when we can each be our own employer? Denis

Waitley (1995) says, "From the day you read this, I urge you to live by another paradoxical proverb: ***You must act self-employed, but be a team player.***

What this means is that you're your own chief executive officer. Start thinking of yourself as a service company with a single employee." William Bridges (1997) pursues this idea when he says, "...you need to understand why traditional jobs no longer fit this world and why companies are abandoning them." He quotes Robert Schaen, the former controller of the telephone company, Ameritech: "The days of the mammoth corporations are coming to an end. People are going to have to create their own lives, their own careers and their own successes. Some people may go kicking and screaming into the New World, but there is only one message there: You're now in business for yourself." That certainly gets over the problem of whether CPD, or lifelong learning, is optional or mandatory. The pessimist will say it is about struggle and survival, but for the optimist it is about taking control of our own development and positively influencing our work and the society of which we are a part.

## INDIVIDUAL AND ORGANISATIONAL LEARNING

Already the concept of learning is being applied not only to individuals, but also to teams, groups and organisations. But how can an organisation learn? We can appreciate this if we avoid seeing the organisation as simply the sum total of the individuals it comprises. Consider an orchestra or a regiment. We still talk about the music played by the orchestra and the battles won and lost by the regiment in the past, even though all the original members of the entity have gone. Arie de Geus (1997), formerly with Royal Dutch/Shell, has written about what he calls the living company. He says, "...living entities...are the only entities which can learn" and "Companies can learn *because* they are living beings."

We will need to change our negative attitudes to learning. For many people these have been shaped by various factors: social, political and psychological. School is something we are forced to attend and whilst there we have knowledge poured into us by a teacher who, by definition, knows more than we do. Learning therefore has been seen as a passive activity and one to be avoided if possible. We are taught, educated and trained. We study something to get a qualification to match a job. We have some initial training and when we need some updating we go, or rather are sent, on a course.

It all sounds quite manipulative and yet back in 1971 Ivan Illich was saying that learning is the human activity which least needs manipulation by others. In *Deschooling Society* he had some perceptive and radical things to say about institutional learning, for example, "People who submit to the standard of others for the measure of their own personal growth soon apply the same ruler to themselves. They no longer have to be put in their place, but put themselves into their assigned slots, squeeze themselves into the niche which they have been taught to seek, and, in the very process, put their fellows into their places, too, until everybody and everything fits."

Peter Vaill (1996) pursues this theme. He says, "...institutional learning is likely to be answer oriented...", "Other institutional learning features of training programs are that program participants are assumed to be *qualified* to be there..." and "Behind these ideas lies the assumption that *learning is cumulative*..." Some of our irrational attitudes to education, training and learning can be seen daily in job advertisements. Typically employers ask for holders of specific qualifications: a degree, a diploma, and so on, regardless of the fact that the qualification might have been gained ten or more years ago. Even back in 1985 John Naisbitt was pointing out in *Megatrends* that scientific and technical information was increasing by 13% per year, which means doubling every 5.5 years.

Professional bodies will be seen to have made real progress with their CPD or lifelong learning policies when advertisements appear asking for people whose learning is up to date and related to the work they will be doing today and in the future. Donald Schön (1987) asks, "Can the prevailing concepts of professional education ever yield a curriculum adequate to the complex, unstable, uncertain, and conflictual worlds of practice?" For Schön "...professional artistry is understood in terms of reflection-in-action, and it plays a central role in the description of professional competence", whilst Longworth and Davies (1996) believe, "Lifelong learning challenges the traditional university role as a repository of the intellectual capital of a nation and as a centre for research and excellence only."

## LIFELONG LEARNING FOR THE ENGINEER

For one profession's approach to lifelong learning we can turn to the European Society for Engineering Education (SEFI). SEFI has issued a discussion document (Padfield *et al.*, 1998) with the intention of stimulating debate on professional education and lifelong learning for engineers. The SEFI working group on lifelong learning and continuing education in engineering says, "It is one of the primary understandings of lifelong learning that an individual must possess certain "lifelong learning skills". A fully effective "adult learner" is able, fluently and without external direction, to:

- audit and assess what they already know and can do
- work out, at a level of detail that will differ from individual to individual, a career and a learning development plan
- integrate, into their learning, acknowledgement of their need for continuing *personal* development in the private as well as the professional realms
- understand the qualities of different kinds of knowing, of understanding, and of skills and competence; how the different kinds of knowledge inter-relate and reinforce each other
- reflect upon their knowledge, establishing links between different kinds of knowledge, and formulating relevant theoretical constructs to explain it
- conduct research into elements of professional knowledge, practice and competence that lie within the context of their work, in pursuit of solutions to "problems of the day", personal professional development, and (more generally) the development of their profession."

## A POSSIBLE FUTURE

Just as the traditional roles of universities and colleges are being questioned, so the learning future that I envisage will present strong challenges to professional institutions. Such institutions will, I believe, need carefully and critically to examine their roles both as qualifying bodies and as learned societies. On what basis are they conferring their qualifications and titles and should they move away from the role of learned societies, primarily serving their members, to become learning organisations with a much wider range of stakeholders?

The new worlds of work and learning offer each of us positive challenges to co-operate with others to reach beyond the old paradigms of command and control. This paper deliberately raises more questions than it answers and, as a way of offering more food for thought and discussion at the workshop, I end by presenting the following as a possible scenario for the future.

- All learning will be lifelong learning. It will be our own individual responsibility, undertaken with help, support and guidance from our coaches, mentors, colleagues and other fellow members of the networks to which we belong.
- In the new learning society we will be neither dependent nor independent, but interdependent, pursuing our learning and development in all manner of ways, acquiring new skills and knowledge as we need and want them.
- Our learning will be formal and informal and the artificial distinction between professional and personal development will disappear.
- We will be skilled at learning how to learn, accessing new information and seeking out new sources of knowledge, using information and communications technologies (ICT) where appropriate.
- The traditional university and college will be subsumed into a global virtual learning network including large companies as well as small and medium-sized enterprises (SMEs).
- Our learning and development will be demonstrated not in terms of qualifications but by means of personal portfolios, open and accessible on the internet.
- The 'job', as we now understand it, will disappear and our work will have new meaning, being seen as a source of creativity and personal fulfilment.
- We will be members of increasingly inter-related global networks for work, learning and development.
- Lifelong learning will be the key to survival and prosperity in the new knowledge-based economy.

## REFERENCES

- Bridges, W., (1997). *Creating You & Co: Be the Boss of your own Career.* London: Nicholas Brealey Publishing.
- Briskin, A., (1998). *The Stirring of Soul in the Workplace.* San Francisco: Berrett-Koehler Publishers, Inc.
- de Geus, A., (1997). *The Living Company: Growth, Learning and Longevity in Business.* London: Nicholas Brealey Publishing.
- Harman, W. and Hormann, J., (1990). *Creative Work: The Constructive Role of Business in a Transforming Society.* Indianapolis: Knowledge Systems, Inc.
- Illich, I., (1971). *Deschooling Society.* New York: Harper and Row.
- Kofman, F. and Senge, P. M., (1995). "Communities of Commitment: The Heart of Learning Organisations" in Chawla, S. and Renesch, J. (eds), *Learning Organisations: Developing Cultures for Tomorrow's Workplace.* Portland: Productivity Press.
- Longworth, N. and Davies, W. K., (1996). *Lifelong Learning.* London: Kogan Page.
- Naisbitt, J., (1985). "Megatrends". Paris: *Organisation for Economic Co-operation and Development.*
- Padfield, C. *et al.*, (1998). "Lifelong Learning in Engineering Education: A Call to Action". *SEFI Document No. 20.* Brussels: European Society for Engineering Education.
- Schön, D. A., (1987). *Educating the Reflective Practitioner.* San Francisco: Jossey-Bass Publishers.
- Vaill, P. B., (1996). *Learning as a Way of Being: Strategies for Survival in a World of Permanent White Water.* San Francisco: Jossey-Bass Publishers.
- Waitley, D., (1995). *Empires of the Mind: Lessons to Lead and Succeed in a Knowledge-Based World.* London: Nicholas Brealey Publishing.

TEND 2000

# Crossroads of the New Millennium

## Imagination, the Individual and the Global Media

Prepared and Presented

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Workshop 2

# Imagination, the Individual and the Global Media

This paper is speculative: it does not report on research done (although I think it opens up some significant questions for research). What it does is take three areas in which there has been a great deal of interesting work in recent times, and speculates on what their connection might mean for education. The three areas are those indicated by my title, and one could ask a number of different questions about the connections, reconfiguring the three in relation to each other. But the questions I am going to ask take creativity and the imagination as the endpoint - as what is being educated for – and ask what are the implications for this of the new kind of subjectivity that is being created by global culture.

## INDIVIDUALITY

There are two (related) underpinning theorisations of individuality that I want to establish here. The first is the notion of the "discursive construction of subjectivity" drawing on the work of various poststructuralist thinkers, but most notably Althusser and Foucault, the second stems from the work of Judith Butler and her notion of the "performative".

In very brief summary, the theory of the discursive construction of subjectivity is that our world addresses us in certain ways through the discourses available in the society, and in doing so, it creates us as a particular kind of person. We become the person who is assumed as the receiver of the discourse, taking on the ideological assumptions, seeing the world in the way the discourse shows it to us. We are subject to many discourses as operating members of society, and what we are as individuals is the sum of the available discourses that we operate in. It is a profoundly anti-essentialist theory, seeing the individual person as socially constructed through and through.

One of the limitations of this conceptual framework is that it does give the impression of the individual person being a *tabula rasa* on which the discourses of the society are imprinted. Judith Butler, working within this general framework, has taken Austin's notion of the performative, and worked with it to develop a more subtle and complex theorisation of the construction of subjectivity (Butler: 1990, 1993, 1997). Again to simplify, but even more outrageously, Butler argues that we are created as individual subjects by acting out the ways of being that society and culture insist on. We perform ourselves into being. This has been

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particularly useful in that it brings the body into consideration, and so sees subjectivity as not just a matter of the mind but as materially embodied. (Her second, and perhaps most influential book is called *Bodies that Matter* (1993).

It is a limitation that such ways of thinking can give no really satisfactory account of irreducible human difference (or perhaps simply do not choose to take it into account), since they see the foundation of human subjectivity as social. It must be stressed that if we are constructed discursively, that each person, through their specific mix of cognitive capacities, libidinal drives, etc. is constituted from a different configuration of the discourses. Not each discourse is equally constitutive for each person, but we are all fairly unique mixes of the available discourses.

The final point that I want to make on the construction of the individual is about the importance of the private domain. Cultural Studies is often scorned by sociologists because of its lack of interest in such things as hard-edged economics, demographics, government regulations and workplace practices, seeing it as frivolously concerned with analysing everyday texts, television and films, newspapers, sporting events and other elements of popular culture, when the real social action is taking place elsewhere. I don't want to underestimate the value of sociological analysis, but I do want to insist on the importance of those leisure texts and the social practices that occur in what Gramsci calls the private domain. The importance of this domain is that it is an area of (apparent) choice, one in which we feel ourselves to be free agents. Whereas we can't choose which side of the road to drive on, or whether or not to pay taxes, we can choose whether we listen to Macy Gray or Philip Glass, watch *Friends* or *The Bill*, buy *Playboy* or *Time* magazine, and these choices are felt to be expressive of ourselves, stemming from and confirming the kind of person we "really" are. So, although the elements in the public realm may be more important to the functioning of society, the elements in the private realm are felt to be closer to what we are as people, and therefore particularly powerful. It goes without saying that the freedom is in many ways illusory, and of course the areas of choice are frequently part of what Althusser has called the ideological state apparatuses (1984), but that does not undercut their significance in constructing our sense of ourselves at all.

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## GLOBAL CULTURE

Saying anything briefly about global culture is almost as impossible as saying anything about the individual, so I need to acknowledge immediately that I am aware I am only concentrating on some very limited aspects of globalisation, and in particular that I am ignoring to a large extent globalisation as an economic phenomenon. If a justification is needed for this, it is that my ultimate concern is what all this means for students in schools, and globalisation tends not to be experienced explicitly in economic terms in their lives. I am also interested in how globalisation is perceived popularly, the kind of construction that is made of it in the media, rather than looking at it in academic terms.

There are a few aspects of globalisation that are important for my purposes here, and since I am interested in experiential aspects, I am inevitably going to be impressionistic.

One of the striking things about current discourses of globalisation is the prevalence of "liquid" metaphors. The basic one is of the "flow" of information, that sense of digitised information coursing freely around the world, more like the world's lifeblood than like a river or a flood. We talk of "channels of information", channels being purposefully constructed by humans, rather than naturally occurring like rivers. There is a great deal of talk of "convergence" these days, the convergence of different media, where that flow of information converges into a single channel, usually the channel of the internet, so that in time newspapers, television, banking services, shopping - virtually all aspects of life, it seems - will be most readily available through the net. Institutions – governmental and corporate - have become "porous", their boundaries uncertain as the information flows in and out.

The other dominant (related) metaphor is that of the net as in "network" (or the web), suggesting the complex interconnectivity of the global world, and of course, the dispersal that is fundamental to it. Sitting at one's machine, one is at a node of this global net, connected with everything out there in cyberspace.

"Space" (as in "cyberspace") is a third metaphor – that one is set free in a virtually boundless virtual universe that is available to race through and command, although this in fact seems less used as a metaphor (as powerfully as it is given imaginative reality in some fiction, particularly the novels of William Gibson), perhaps because the reality of the technology is still so much slower and clunkier and constricted than the metaphor suggests. It's a metaphor beyond globalisation - not constricted to this world – that hasn't quite happened yet, although the notion of the boundlessness of the internet is certainly a current potent image.

As one would expect with anything as powerful and pervasive as electronic global culture, its features are read in polarised ways, and contradictory versions and prognoses are given. It's useful to use these tensions to map out certain features, particularly in relation to how people are seen in terms of globalisation:

## IMPERIALIST/DEMOCRATIC

One version of globalisation is that it is simply economic imperialism. The controlling centre of the empire is seen either as the USA or as large corporations that have outgrown national boundaries (such as Microsoft and Newscorp). The function of the global media (including the internet) is hegemonic, to erase national difference and deliver the whole world up as a market to (American) corporations. People are thus seen as ideological victims.

Alternatively, the internet in particular is seen as profoundly democratic. We have never had such choice before. The sheer uncontrolled and uncontrollable anarchy of the Internet is celebrated, and seen as undercutting the power of nation and corporation. Anyone can set up a web page and make themselves their own media star, asserting their individual existence.

There are various other inflections of this basic opposition:

- The flow is seen to be emanating from the national and corporate giants, but there is also a reverse flow of ideas and demands back that can influence the giants;
- The network/web can be seen as either an entirely dispersed system without a centre, or rather with every node a potential centre in a riot of postmodern relativity. Alternatively, the web is seen as spreading out from a particular imperialist centre, with a very big spider in the middle of it.

The influence of globalisation is seen as homogenising, working to make us all want to consume the same things and see the world in the same way, but on the other hand, it is argued that we have more choice than ever before, and the effect of globalisation is a greater capacity to express individuality and to have customised products that suit ourselves.

## PASSIVE/ACTIVE

There are two visions of the person operating on the internet or with multimedia: one seeing them as passive, the other as active. Working on a computer is sedentary; but of course one is interacting with the screen in a physical way that one isn't even with television for example. One influences what appears. I actually think that the classic active/passive dyad is not quite accurate here. The differing views depend on whether the human being is seen as becoming an extension of the machine, or whether she/he is seen as in control of the machine. The negative side of this draws on the myth of the robot or the cyborg, and stems from the fear of dehumanisation, of people turning into machines. The positive side draws on the notion of technology as tool, extending human capacity in a controlled enhancing way, the machine working under the control of the human being to achieve human purposes.

## ISOLATION/CONNECTION

There is another oppositional access in play when conceptualising people sitting at their machines, accessing the internet. They can be seen either as isolated or as connecting with a rich and extensive global community. Sitting looking at a screen, one is not connecting physically with those around but losing contact with one's immediate material reality. On the other hand, there is a great deal of rhetoric about connecting with a global community, that the local is replaced by the whole world. Actually, more often than a sense of connecting with the whole world, the emphasis is on connecting with a virtual community of like-minded people, people with the same interests. Some would see this as creating stronger deeper communities, others will see it as a dangerous fragmentation.

I hope that the connection between what I have been saying about global culture and what I said about the construction of the individual is clear. The engagement with the texts and even the bodily practices produced by participating in a global culture will have a profound effect on how we might conceive of ourselves as individuals. The texts we receive will be discursively constructing our subjectivity; our physical disposition in front of the computer screen will be constructing us in certain ways.

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I have been concerned to try to seem even-handed in setting up the oppositions in the attitudes to global culture, and not suggest that one or the other side is the "true" one, because neither or both in any case are simply true. Undoubtedly the internet can be seen as either positive or negative and has enormous potential actually to be both: it should be a major feature of education to try to release the positive potential.

## IMAGINATION/CREATIVITY

There is a great deal of work around on imagination and creativity, although not as much of it as one might expect relates to schooling. It is an area in which there is much still to be done. I want, just briefly to sketch in some of the features of the creative imagination.

Basically, imagination is a function of the human mind, like memory or reasoning or any of the other functions. I want to make this point strongly to stress that there is nothing mystical about the creative imagination: it simply operates on the material that is present in the mind. It has both cognitive and affective aspects, bridging the two domains.

In moving out from this basic conception, my thinking has been most influenced by some work by David Feldman, Mihaly Csikszentmihalyi, and Howard Gardner (1994), although I am just going to introduce here a couple of elements from their model that I think are suggestive for my purposes in this paper, and they would undoubtedly see the account I give as seriously distorting their work.

The crucial thing about the action of the creative imagination is that it is transformative. It takes preexistent material and transforms it. The transformations often seem to be combinative: i.e. disparate fragments are taken and brought together to produce a new whole. There are several implications of this transformative nature that I want to point out.

1. That the imagination produces something new, but it does it out of pre-existing materials. As opposed to some older beliefs about the imagination, it doesn't operate divorced from the outside world, cavorting in its own inner space, but rather takes what the outside world presents to the mind and operates on it.

2. That creativity will usually happen within a discipline, within a particular field with its own boundaries and rules, and it will be different in each. It may draw on insights garnered from other fields. The boundaries and rules may be extended, but the control of the discipline is presupposed, even though it might seem from the outside that the creative development is a totally new way of thinking.
3. That creativity will always be socially/culturally conditioned. Since the imagination works on material that comes from the world of a particular culture, perceived by someone from within that culture, the outcomes will be very different depending on what social and cultural frameworks the imagining person is operating in.

However, given all that, I would also claim: That the product of the imagination has an irreducibly individual element. Because the imagination is not always under rational control, because the self that produces the transformations is a unique amalgam of discourses and experiences, the creative product will be individual and personal, and will tend to be strongly felt as such.

The final issue about the creative imagination that I want to touch on briefly is the matter of what drives it. The general agreement is that it is desire for things to be different than they are. Some inadequacy in reality, some perception that things would be better if they were changed, or even some fear of the present state of affairs drives people to create a way to make things different, to solve the problem. There has been interesting work on creativity and the affective realm (see, for example, Shaw and Runco 1994), and creativity does seem often to have both an affective origin, and an affective element in its operation, even if only at the level of the intensity with which the mind becomes open to new possibilities or of the excitement of discovery.

## BRINGING IT TOGETHER: WHAT IT MEANS FOR EDUCATION

These three areas that we have been looking at seem disparate, and it might appear that it will take a considerable degree of imagination and creativity to bring them together and relate them to education. It will take even more skill not to become simplistic and fall back on superficialities in the attempt to generalise.

The first point I would want to make is that, while there is a great deal of very proper interest in the impact of global technology on education in terms of curriculum and pedagogy, we must not forget that globalisation is delivering a different kind of person to schools to be educated. If you are a teenager who spends time playing CD-ROM games, downloading music from the Internet, participating in chat rooms (perhaps under a pseudonym with an alternative personality you've created), then you are not going to be the same kind of person as those who were being educated ten years ago.

I don't want to try to map out what the differences will be, because obviously the differences will be extraordinarily complex and subtle, as well as extraordinarily various. I will, however, suggest two very general things. First of all, I want to invoke the notion of the postmodern subject, the kind of person who operates in different discourses, identifies with different subject positions in different spheres, and does not see their reality as fundamentally invested in any one of them, but rather as dispersed over the field. They are not concerned by inherent contradictions because they are satisfied to live out different realities in different sphere. One might see it as the human being as portfolio: postmodern person is portfolio person. Increasingly students are operating with this kind of multiplicity.

The second element is a kind of openness and confidence, an expectation of diversity and even chaos but without any sense of panic in dealing with it. There is a sense of being in control, not through intellectual command, but through having control of the technology, having the ability to access whatever you want, setting the search engines running. But also there is a sense of being rather pleasantly out-of-control as you leap across the hyperlinks, never being exactly sure what might turn up. This is met with a blasé openness, and a feeling that one can make use or not of what appears as the mood or the need arises. The input of teachers is just part of the avalanche of information coming that may or may not be engaged with.

The implications for curriculum generally are that at least part of the work of schools is to make the handling of global information more purposeful, to help students search more efficiently, to help them be more discriminating in their sifting through what they access, to make them vigilant against distortion.

However, although the getting and the sifting of information may be fundamental, it is certainly far from sufficient if we wish to develop a creative curriculum, and I want quickly to explore just a few aspects of what happens when we bring what I was saying about global culture up against the work on creativity to suggest some of the dimensions of a curriculum designed to promote creativity.

I was suggesting that the kinds of oppositions around the popular perceptions of global electronic culture suggest the positive and negative potential. We need to equip students to work with the positive potential and avoid the negative. There is no doubt that the internet can make one subject to the corporate will, but there is also no doubt that it can be a very free and open medium in which an individual can have a degree of control. The flow of information can simply carry you along, or you can channel the flow to your own purposes. One can be passive and just take in what's given, but one can be active and use the material in ways that serve and confirm your individuality. Students need to be equipped to make the latter choices.

If the creative imagination works on external material, then there is no doubt that global culture provides material in extraordinary amounts and of extraordinary diversity. But it is not just a matter of taking in the material, if one wants to be creative; it is a matter of doing something with it. As I said, the basic operation of the creative imagination is transformative. The actual operation of the internet, or indeed of the global media in general, supports this in some ways. Information is continually being recontextualised and so its meaning changed as you flip from bit to bit.

More significantly, digital information, not having a material form is easily modified, and so there is extraordinary potential for transformation. Students need to get into the mental habit of asking critical questions about the validity of information, but also of asking questions about what it can be used for, looking for ways in which it can be usefully combined with other information, brought into meaningful arrangements, transformed into something more useful.

As well as getting them to discard rubbish, it seems to me important to encourage them not to foreclose too quickly, but to see the potential in what is there. Keats in one of his letters coins the much-celebrated phrase, "Negative Capability" as being the quality that distinguishes the great poet, the person of creative imagination. It is the ability to stay in doubt and explore "without any irritable reaching after Fact and Reason" without trying to pin things down and make them manageable. Our postmodern students are half-way there to that quality, with their sense of relativity and their blasé attitude, but education should be working to make them more actively seek out the potential, rather than simply taking in the information or being dismissive.

So the open flow of the internet, and the interactivity possible with it has the potential to enhance creative work, but education needs to do more than simply let students loose. Education is also about discipline, and so is creativity. One doesn't see potential in something unless one sees a framework in which it can fit. Information is very often meaningless unless the context is known. Creativity can't be developed in abstract: it must be creativity in a field or a combination of fields. (I wouldn't for a moment want to underplay the importance of multidisciplinary or multimodal work.) Creativity also implies moving beyond what is known or has been done before, and you would never know if you were creative or not if you didn't know the field. To think outside the frame, you need to know where the frame is. So, a creative curriculum is not a generic one or an undisciplined one. Students must be able to contextualise and frame the flow of information to make it useful, to effect meaningful transformations on it.

The information, like the student, is also socially contextualised, albeit in a global culture, and students need to understand that. Creativity happens within a social context. Global media can give the impression of universality, but, of course, everything is a product of a particular culture, and to work creatively one should know the understandings that are underpinning the material and the limitations imposed by the cultural framing, perhaps in order to see beyond them. One can appropriate and transform the material, but this is more likely to have a genuinely creative outcome if done with cultural understanding.

Finally, I spoke about the grounding of creativity in affect, in the desire for change or at least the desire to fulfil some purpose. This seems to me to be the greatest difficulty in educating for creativity, involving the student in an engaged and purposeful way. I think there are no easy answers on this one, although a problem-based curriculum is more likely to achieve the necessary creative engagement.

In a culture that is changing so rapidly, the need for a curriculum that promotes imagination and creativity is apparent, so that our students can feel themselves in control of the change, and for the change to be purposeful. As you will have seen, I have few answers, but I hope I have suggested something about the scope of the challenge.

## REFERENCES

- Althusser, L., (1984). *Essays in ideology.* London, Verso.
- Barker, C., (1999). *Television, Globalisation and Cultural Identities.* Buckingham and Philadelphia, Open University Press.
- Butler, J., (1990) Gender *trouble: Feminism and the Subversion of Identity.* New York, Routledge.
- Butler, J., (1993). *Bodies that Matter: On the Discursive Limits of 'Sex'.* New York and London, Routledge.
- Butler, J., (1997). *The Psychic Life of Power: Theories in Subjection.* Stanford, Stanford University Press.
- Feldman, D., M. Csikszentmihalyi, et al., (1994). *Changing the World: A Framework for the Study of Creativity.* Westport, Connecticut and London, Praeger.
- Shaw, M. P. and M. A. Runco, eds., (1994). *Creativity and Affect.* Norwood, New Jersey, Ablex.
- Willinsky, J., (1999). *Technologies of Knowing.* Boston, Beacon.

TEND 2000

## Crossroads of the New Millennium

# Strategic Management Of Quality And The Challenge Of The New Millennium: Prospects For Managing The Tension Between Accountability And Improvement In Further And Higher Education

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# Abstract

Throughout the 1990s 'quality' became a central concern in further and higher education (FHE) globally. This took place in the context of a changing relationship between the state and education. Demands for responsiveness and accountability have become paramount. As FHE reaches the new millennium, it finds itself at a crossroads. Education systems in the 21st century will be very different from current models because the context within which they will operate will change significantly. The paper sets out some of the parameters which are likely to prevail. Implications for the strategic management of quality are considered, as is the possibility that a paradigm shift will be required in quality assurance in FHE. The paper asks whether FHE organisations in the new millennium will be manageable entities. A key element will be the management of tensions, at the centre of which is a continuing requirement to reconcile and manage the tension between quality as 'accountability', and quality as 'improvement'.

The paper draws on results and lessons from a five-year, ethnographic study of a change management project at a higher education college, (NewColl). It is argued that in the process of design and implementation, quality management policy becomes changed and that it is necessary to take account of emergent as well as designed features of policy. Managers are constrained by contextual realities. If they are to intervene successfully they need to achieve alignment between change projects and the operating context. Accordingly, it will be important for individual institutions to assess and interpret the current and emerging climate of operation. This means paying attention to the preoccupations of external stakeholders and regulatory bodies, and to 'the psychological contract' with staff. But equally, it is argued, it is important to strike an appropriate balance between professional autonomy and professional accountability.

The paper concludes by proposing that education organisations are not beyond purposeful intervention - even in circumstances of turbulence, change and uncertainty - but that there are no simple 'futuristic' prescriptions for managing change projects. Following Fullan (1993), it is argued that 'Change is a journey, not a blueprint'.

# Strategic Management of Quality and the Challenge of the New Millennium: Prospects for Managing the Tension between Accountability and Improvement in Further and Higher Education

## INTRODUCTION

The theme of this paper is that for those aspiring to the successful management of change in quality and standards in further and higher education (FHE) as it enters the new millennium, it is essential to take full account of the tensions which emerge through the change and implementation processes. Managing change in the context of quality, it is argued, is concerned with managing tensions. At the centre of this is a continuing requirement to reconcile and manage the tension between 'quality' as accountability, and 'quality' as improvement.

The paper begins by reflecting on the legacy of the 'quality revolution' of the 1990s and by acknowledging that, as FHE enters the third millennium, quality has reached a crossroads. Some strategic challenges which face FHE in the new millennium are also identified. The tasks for strategic quality management arising from attempts to reconcile accountability and improvement are highlighted through consideration of an institutional case study. This leads in turn to discussion of how leadership and the management of change might be conceptualised. The paper also puts forward suggestions as to key ingredients for progressing change and quality management initiatives, drawing particular attention to 'alignment with context' and the emerging 'climate of operation', and the need to take account of the values and expectations of staff. The paper concludes by setting out some lessons for leadership and management practice which are relevant for the strategic management of quality in the new millennium.

## QUALITY AT THE CROSSROADS: THE LEGACY OF THE 1990S

There is considerable interest in, and a growing number of contributions about, the likely form and structure of FHE in the twenty-first century, and re-evaluations are taking place in many countries. Clearly, FHE has been going through what Kuhn (1970) would describe as a paradigm shift. However, those playing the 'future' game have been largely unable to abandon the core elements of traditional notions of 'the university' or 'the college'.

An underlying theme of the paper is that as FHE enters the new millennium, it finds itself at a crossroads in terms of quality and also, increasingly, both academic and service standards. Implications for the strategic management of quality and for the development of quality assurance systems are considerable. But to understand the immediate challenges of the future, it is necessary to reflect on the influence of the recent past.

Undeniably, one of the main legacies of the 1990s is that quality has become a central concern in FHE globally. This development has taken place in the context of a changed relationship between the state and FHE in which demands for accountability have become paramount. For some commentators, and for many in the academic community, these developments are associated with the rise of 'managerialism', and even a withdrawal of the 'trust' accorded to FHE, not least in the wake of more demanding external regimes for quality assessment and accreditation (Trow, 1994). Such developments can be set alongside demands for greater responsiveness from FHE to the requirements of an increasingly global workplace. Within these parameters there has been a dramatic increase in student numbers, a sharply reducing unit of resource, higher student-staff ratios, and changes in sources and methods of funding. Massification, cost effectiveness, performance assessment, standards, institutional and market accountability, have all become keywords. Institutions have yet to fully resolve the growing challenges represented by changes in funding methodologies, the student profile, academic practices, new technologies, and delivery mechanisms. Moreover, as is illustrated in the next section, further and higher education systems in the 21st century will be very different from current models because the context within which they will operate will continue to undergo further significant change.

As far as quality is concerned, by the end of the 1990s changes in the context and conditions of academic work (Smyth, 1995; Martin, 1999), particularly when viewed alongside the pressures of external accountability and a higher level of expectations from a variety of stakeholders, had led many to question whether, with a general movement towards massification in systems of FHE, quality could be maintained or managed effectively, or whether requirements for 'accountability' and 'quality improvement' could be reconciled. It has led to the acknowledgement that the challenges to institutional leadership in today's further education colleges and higher education institutions are considerable and will become even more so during the new millennium.

As this paper suggests, in view of the extension of the monitoring activities of external quality and accreditation bodies, and the development of 'robust' internal quality monitoring arrangements, there is no doubt that increased accountability and intrusion have presented a significant challenge for institutions and staff at all levels. Many academics have grown increasingly sceptical of, and resistant to, the growth of the 'quality industry' and the 'quality burden' (Watson, 1995). This is often viewed in terms of academic de-professionalisation (Trow, 1994). For many 'front-line' staff this has led to suspicion of management motives, to the breakdown of reciprocal accountability and trust, and perhaps even to an irresolvable tension between the 'corporation' and the 'collegium'. For senior managers it has led to new challenges in terms of leadership and institutional management.

## PARAMETERS FOR FHE SYSTEMS IN THE TWENTY-FIRST CENTURY

The extent of such challenges becomes even more evident when we note the complexity of the post-industrial environment which FHE faces as it enters the new millennium. The dynamic nature of this environment is such that academic organisations and institutional managers will require appropriate 'adaptation strategies' (Sporn, 1999), and effective management in terms of policy making and policy implementation, not least in the area of quality and standards. Several key dimensions of this changing external 'task environment' (Middlehurst, 1997) merit attention for present purposes. These are: increasing globalisation; the impact of new technologies; and the rise of the corporate curriculum. As is illustrated below, each of these in turn raises its own particular issues regarding quality and standards.

### a) Some Strategic Challenges Facing FHE in the New Millennium

### GLOBALISATION

Globalisation is not new. It has been an integral element of debates regarding the health of national economies and organisational futures for some decades. But colleges in the FHE sector are increasingly aware that they operate in a global environment and, accordingly, are seeking to reflect in their curricular the internationalisation of education and training, and of business and career mobility. Moreover, with the development of both satellite and electronic international multimedia communication, there is no doubt that the successful colleges of the twenty-first century will be efficient and effective in terms of both the delivery as well as the production of knowledge. In this context, quality assurance of new forms of production and delivery of educational materials will become a major issue.

## IMPACT OF NEW TECHNOLOGIES

The global internet and digital technologies represent a major catalyst for change. The design and delivery of educational programmes will need to keep pace. The rise and burgeoning success of the corporate university (Corporate University Survey, 1999), for example, illustrates the potential for targeting learning opportunities at specific sectors of the population, and shaping the style, mode and content of education around an analysis of quite specific needs and requirements.

Clearly, improvements in teaching and learning can readily be achieved through harnessing new technologies. However, technology is also forcing a seismic shift in various balances and relationships. The growth of expert systems, the decreasing shelf-life of knowledge, and the routinisation of hitherto 'professional' and 'academic' tasks are but a few examples of developments which have considerable implications for curriculum design and for systems for quality assurance or accreditation. How far, for example, can approaches to accreditation and quality assurance intended for human systems be transformed so as to be reconciled with autonomous software systems? Or, is an entire paradigm shift in academic quality assurance required?

## THE RISE OF THE CORPORATE CURRICULUM

As individual colleges seek to become more learning-focused and to successfully communicate their 'corporate brand' (King, 1995) to students and employers, they face a number of obstacles. Traditionally, the predominant view has been that the core of the academic enterprise, the course as 'product', and the quality and standards 'control' of the product, lies largely outside corporate control. While, in the private sector, the 'product' is subject to strict managerial monitoring, in colleges issues such as curriculum structure and delivery have traditionally been regarded as largely collegial, peer-related, or even individual matters. However, as the notion of 'curriculum as product' becomes reality, and as colleges search for growth and efficiency, but with improved quality and standards, then it will become an organisational requirement that senior managers will be carried more directly into the heart of the academic domain.

The challenge for quality management, centres in part on the tensions between, on the one hand, the local level of department, the point of maximum professional and academic autonomy in terms of curriculum delivery and design, and, on the other hand, the requirement for wider institutional solutions to problems which arise from the need for the 'product' to meet institutional targets. This scenario, and the changes which it signals, is as likely to be as unsettling and threatening for middle managers as for 'front-line' lecturers, since it will undermine traditional departmental configurations and territorialities in respect of programme and curriculum control. More generally, it may make the tension between 'corporation' and 'collegium' even less resolvable.

Given such anticipated features of the changing external environment as those identified it is self-evident that, as FHE enters the new millennium, it finds itself at a crossroads. The attendant challenges for the strategic management of quality are considerable. Indeed, one of the key questions which the paper asks is whether FHE organisations in the new millennium will be manageable entities. The view put forward here is that managers are constrained by contextual realities. Moreover, if institutional managers are to intervene successfully for the purpose of the strategic management of quality and standards, they need to achieve alignment between change projects and the operating context. A key feature of this is the management of tensions, not least with regard to the continuing task of reconciling the requirements for accountability with those for improvement in the area of quality management. Here, the interests of various stakeholders come into play, from staff and students to various other interest groups, such as funding bodies, regulatory and accreditation bodies, and collaborative partners. There is no doubt that the range of, and balance between, stakeholders will change as FHE proceeds into a new era. But what, specifically, are likely to be the prevailing parameters for FHE systems?

### b) The FHE System of the Twenty-First Century

Until the 1980s the rate of change in FHE had been relatively slow. This quickened during the 1990s to such an extent that it is evident that FHE in the twenty-first century will differ greatly both in terms of models and operating context. Arguably, as Harvey (1996) has indicated in his discussion of the 'federal omniversity', key features will include a regional, federated structure involving, perhaps: a federation of semi-autonomous institutions located in a geographic region; a focus on all levels of post-compulsory education; closer and more direct links with commerce and industry; more learning in the workplace; electronic networking and the disappearance of fixed boundaries. More specifically, this would entail:

- a mass, internationalised system shaped by information technology
- smoother access for students and continuous lifelong education in college, work and home
- disappearance of lectures and a shift towards tutor roles centred around facilitating learning
- clear emphasis on student attainment and learning outcomes
- quality and standards which take account of international comparability
- greater emphasis on quality culture and less emphasis on external monitoring regimes
- downward shift in the level of government funding; more emphasis on 'pay-as-you-learn'

### c) Some Implications for Quality and Standards

Where, then, does quality fit into this projected scenario? Under such a model, primary responsibility for setting standards and for monitoring quality is placed on the institution, with the notion of 'self-regulation' becoming predominant (Jackson, 1996). Harvey (1996) refers to this in terms of 'responsive accountability' and 'delegated responsibility for quality improvement'. As argued earlier, there will be a continuing need to reconcile the requirements for 'accountability' and 'improvement'. However, quality monitoring systems in the twenty-first century will need to address concerns such as the following:

- effective action-oriented internal processes for quality monitoring and improvement
- explicit service standards relating to the quality of the student experience
- internationally comparable standards for student attainment and an explicit focus on employability
- effective use of funding

## RECONCILING THE TENSION BETWEEN ACCOUNTABILITY AND IMPROVEMENT: A CASE STUDY

At this juncture, to assist discussion of the main themes of the paper relating to quality management and the management of policy implementation in circumstances of change and uncertainty, use is made, for illustrative purposes, of an institutional case study and an 'insider' research project.

### a) Design, Development and Implementation of a Quality Assurance System

The context for the longitudinal research which I undertook over a five-year period, can be gleaned in part from the rationale which underpinned the organisational change and policy initiative for which I had strategic responsibility. The quality management project involved reviewing and developing quality assurance procedures at a higher education college (NewColl) which would enable it to fulfil its vision of achieving 'University College' status. There were a number of drivers of change impacting on the college's 'task environment' (Middlehurst, 1997) and these heavily influenced the definition and design of the components and formal properties of the quality assurance system - what contingency theorists (Child, 1984) refer to as their intended and designed features. The development aims for the system centred around accountability and improvement and included:

- satisfying external accountability requirements of funding council, and other national quality bodies, for robust quality assurance arrangements;
- satisfying internal requirements for procedures which withstand internal and external scrutiny; and
- facilitating quality development and improvement of the student learning experience and the student and staff learning and working environment.

The overall project was undertaken in circumstances of organisational turbulence, rapid change, and prolonged uncertainty in the external environment. Moreover, in such circumstances, the task of reconciling the underlying tension, as represented by the demands of accountability and those of improvement, posed a considerable challenge in terms of quality management, the management of change and institutional leadership. From this case study a number of lessons can be drawn which have general applicability in the context of the present discussion. These are set out in the final section of the paper.

### b) 'Insider Research' Project

As noted, in addition to acting as project manager for the design and implementation of quality assurance systems, I was also, simultaneously, conducting an ethnographic study of the college. The research aims included investigation of whether, in the view of key stakeholders such as quality monitoring bodies, and academic and academic support staff, the purposes of the quality assurance system had been met: whether internal and external accountability requirements had been satisfied, and quality improvement facilitated for staff and students. A range of methods and data sources was used to convert 'thin' into 'thick' descriptions (Geertz, 1973, ch. 1) and to provide insights into staff perceptions of the achievements of quality assurance procedures and quality management generally.

### c) Results: Policy Implementation Gap

As described more extensively elsewhere (Newton, 1999), the main results of my research, both qualitative and quantitative, revealed that while academic and academic support staff, at all levels, concurred with the view that both external and internal accountability requirements had been met, there was a marked 'implementation gap' requiring explanation. This was manifested in three major divergences.

i. evidence from external quality reports indicated that quality improvement requirements had been met, whereby interview data with NewColl staff showed markedly less support for such a view.
ii. differences were also apparent, on most issues, between the views of 'managers' and 'managed'.
iii. some academic units displayed more negative views on key issues regarding the quality system, quality management and organisational change, than others.

This meant that accountability and improvement had not been fully reconciled. This was because situational factors relating to climate of operation, context, and actors' subjectivities, mediated to prevent accountability and improvement from being fully reconciled and served to undermine the implementation of preferred institutional policy. In the present context, to support the underlying theme of this paper, relating to the need for institutional managers to paying close attention to the current and emerging climate of operation, and to the 'psychological contract' with staff, it is suggested that the kinds of challenges which this points to will have a continuing relevance for understanding some of the key tasks which will confront institutional managers as they enter a new millennium which carries with it its own environmental uncertainties and potential for organisational complexity and even 'grotesque turbulence' (Webb, 1995) in FHE.

### d) Principal Quality Management Challenges at NewColl

The challenges which face a senior manager seeking to intervene with purpose in a complex, developing situation, in a highly professionalised organisation, are many. At NewColl, the principal challenges which presented themselves in the 'quality project', and which, it is suggested, will continue to be directly relevant for the strategic management of quality in FHE as it enters the third millennium, can be summarised as follows:

- the task of attempting to reconcile the demands of accountability and improvement
- the need to seek alignment between 'philosophy', 'technology', and 'context'
- sustaining the integrity of the quality system, especially from the point of view of staff
- the requirement to deliver tangible and measurable improvements for staff and students
- the need to develop and implement a quality management system which delivers improved quality rather than merely an improved system or 'better bureaucracy'
- the requirement for effective leadership and communication in support of change management efforts
- address the 'psychological contract' with staff

## CONCEPTUALISING LEADERSHIP AND THE MANAGEMENT OF CHANGE

Identifying and meeting such challenges is clearly crucial for institutional managers if they are to be able to intervene purposefully in the developing organisational situations which lie ahead. But this in turn is greatly facilitated by the ability to conceptualise change management effectively and realistically.

### a) The Notions of 'Culture' and 'Organisation'

It is now commonplace to depict and conceptualise institutions of FHE in terms of 'organisation'. As Weil (1994, p 24) noted in her discussion of the emergence of what were then relatively new notions of organisation and management: Five years ago, to refer to a university or college as an 'organisation' ran contrary to the deeply embedded currents of professional autonomy and 'collegiality' in decision making. But FHE has moved on from McNay's collegial academy (McNay, 1995), or the tribes and territories portrayed in Becher's academic community (Becher, 1989).

Some insights into this are afforded by considering the notions of 'culture' and 'organisational culture'. 'Culture', it is argued, should be viewed pluralistically; 'organisational culture' entails competing value systems and should be viewed as socially constructed by actors rather than merely enacted by members of an organisation. Indeed, there are dangers in viewing organisations as entirely rational entities. Moreover, my research confirms that it is prudent to avoid uncritical notions of the manager as 'change hero', or as the sole determinant of change.

### b) Managing Policy Change: the Challenge of Unpredictability

As noted in the earlier discussion of strategic challenges facing FHE as it enters the new millennium, academic organisations face considerable uncertainty and change, and also tensions which need to be understood in order to be managed. However, as Wilson (1992) observes, in much of the organisational change literature it is the management of change rather than the analysis of change which predominates. For Burnes (1996), such approaches are open to criticism due to their limited applicability to the range and complexity of situations found in everyday organisational life (p 110). A linked issue when analysing change is the extent to which change processes should be viewed as 'planned' or 'emergent'. In this paper, following Burnes (1996), the emergent approach is viewed as attractive since it stresses the developing and unpredictable nature of change (Burnes, 1996, p 187). It recognises that some organisations operate in a turbulent, dynamic and unpredictable environment...to which they continually have to adapt (p 194).

It follows that one of the principal messages of my research is the importance of context for the management of policy initiatives (Pettigrew, 1983). What is achievable with 'quality' in a FHE organisation should not be seen as a blank sheet. The size, stage of development, strategic priorities, blend of organisational politics, and even the particular vulnerabilities of a college, are key considerations. They represent a complex combination of constraint and opportunity. This raises questions around whether organisations are manageable entities. It also resonates with the sorts of concerns and problems which arise from discussions of issues around the 'quality at the crossroads of the millennium' theme.

### c) Leadership and Change

Context and circumstances are also key considerations when conceptualising leadership. As Middlehurst (1991, p 3) suggests: Leadership is linked both to a context and a constituency, it is commonly viewed as a contingent construct. Following Adair (1983), Middlehurst (1997, p 188) also notes the symbiotic relationship between change and leadership. Drawing attention to Adair's (1983) observations on changing contexts, uncertainty and instability, Middlehurst observes that: The existence and the experience of a turbulent environment...creates both a psychological and a practical need for leadership (p 188). The reference here to the 'psychological' and 'practical' requirement for effective leadership in circumstances of turbulence and uncertainty again resonates with the underlying concerns which arise in the context of the 'crossroads of the millennium' theme. This dimension is developed further in the next section of the paper.

### d) The Importance of Context and Climate of Operation

In my research, to facilitate understanding of the particular case study and research site, NewColl, I explored several conceptual approaches. These are, the contingency approach (Hinings et. al., 1971; Child, 1984; Mullins, 1989); garbage can theory (Cohen et. al., 1972; March and Olsen, 1976); and the contextualist perspective (Pettigrew, 1983; 1985). In selecting these I followed Williams (1988), whose purpose in choosing this interpretive set in his studies of corporate planning was to encompass both the designed and emergent properties of organisations and to find a means of analysing the cultural and micropolitical dimensions of organisational change (p 8).

The contingency approach is principally concerned with the designed and intended properties of organisations. Alignment and judgement are important considerations; there is no 'one best way'. Garbage can theory focuses primarily on the emergent features of organisations. March and Olsen (1976) specifically address higher education institutions. This theory is informed by the notion of organisations as 'organised anarchies'. In focusing on the political or irrational aspects of organisation, the approach rejects the rational linear view of planning, implementation and decision-making.

Contextualist analysis is preoccupied with both the intended and emergent features of organisation and can therefore be readily related to contingency and garbage can approaches. For Wilson (1992), one of the noteworthy features of Pettigrew's (1985) work is the attempt to span both process and implementation. Williams (1988) placed similar emphasis on this iterative aspect of policy making and implementation, noting that: Contextualist analysis aims to provide managers with an understanding of the iterative relationship between context, process and outcomes (p 12). In my own case, contextualist analysis succeeded in providing a basis upon which, as researcher, manager, and reflective practitioner, I could understand and manage the change process and the underlying tensions. My research has validated the contextualists' view that managers are neither 'change heroes' nor 'passive victims'. Contextualist analysis alerted me to the emergent properties of the environment, the organisation, and the quality system. This again has a considerable bearing on matters which the notion of 'quality at the crossroads of the millennium' prompts us to consider and reflect upon.

## MAKING PROGRESS IN THE MANAGEMENT OF QUALITY: KEY FACTORS IN CHANGE INITIATIVES

From the foregoing, it is suggested that there are four areas which provide points of reference for institutional managers wishing to intervene in developing organisational situations for the purpose of progressing quality management initiatives. These are:

- alignment with the 'realities of context'
- the psychological contract
- leadership, communication and the management of change
- professional autonomy or professional accountability?

### a) Alignment with the 'Realities of Context'

The design and development of the quality assurance system at NewColl is best understood in terms of Williams (1996, p 62) framework, developed to evaluate his own college's policy and practice, the key elements of which are 'philosophy', 'technology', 'context' and 'alignment'. As with Williams (p 62), alignment was sought between philosophy, technology and the realities of context. Each is discussed briefly below.

## PHILOSOPHY

Here, philosophy is taken to mean the shared values and ideals, which inform the approach to quality (Williams, 1996, p 61). A key reference point was the requirement of external quality bodies and other stakeholders for self-assessment and self-evaluation at programme level and also at institutional level.

The features of a quality culture to which NewColl aspired can be depicted in the following elements, drawn from the HEQC publication 'Learning from Audit':

- an open and active commitment to quality at institutional levels, and an enthusiasm for and commitment to teaching, learning and the care of students
- a willingness to engage in self-evaluation and to adopt a self-critical approach to academic
- activities with a focus on development and improvement
- a firm regulatory framework, clarity and consistency of procedures and explicit responsibilities for quality control and quality assurance
- dedication and conscientious support for quality assurance among administrators
- communication and liaison across the university, an emphasis on obtaining feedback from a broad range of constituencies and a clear commitment to identifying and spreading good practice
- prompt, appropriate and sensitive managerial action to redress problems, supported by adequate information (HEQC, 1994, p 5)

This describes well the elements with which I, as quality manager, sought to underpin NewColl's system. It also describes what I regard as universal requirements for quality management systems in FHE.

## TECHNOLOGY

'Technology' equates with the components of a quality system. Currently, a typical set of arrangements for a college's academic quality assurance system includes the following:

- systems for quality assurance

- operation of quality assurance systems
- personnel involved in quality assurance
- integration of validation, review and monitoring.

Moreover, one would typically expect to find processes for:

- the validation and review of programmes
- annual monitoring
- making amendments to programmes
- preparation for external quality assessment at programme and institutional levels
- student feedback.

In sum such a system would entail procedures which focused on:

- the design of a programme
- the inputs to the programme
- the programme process
- the outcomes of the programme

Arguably, this dimension of 'technology' represents one of the greatest areas of difficulty and challenge as FHE enters a period of uncertainty and change wherein the design, delivery, and indeed globalisation of education take on new and unprecedented features. Key shifts which will present a severe test for institutions, either individually or collaboratively, include: trends towards partnerships; new forms of delivery; more online and distance provision; and the emergence of corporations which offer both programmes and awards and which present severe competition for more traditional providers. The traditional role of academics as professionals at the centre of quality assurance and quality monitoring will also undergo considerable change. All of this means that much of the 'technology' of current regulatory, accreditation, and quality assurance arrangements is already beginning to undergo change, and is in some cases looking distinctly outmoded.

## CLIMATE OF OPERATION

A further message from my research is that it is important always for individual institutions and senior managers to assess the current and emerging climate of operation. Clearly, this is also an important message as we look towards the kinds of changes in the operating environment which have been described and anticipated earlier.

This element of 'climate of operation' requires that attention be paid to the preoccupations of external stakeholders and regulatory bodies, and also, as is argued in the next section, to the expectations of, and 'psychological contract' with, staff. At NewColl, the challenge of meeting such expectations was compounded by a combination of circumstances including sector-wide problems of a changing funding methodology, government capping of student numbers, a declining unit of resource throughout the sector, and severe competition from other colleges in the sector.

This focus on 'climate of operation' points to the need to pay attention to the important precept of 'alignment' (Child, 1984), a key concept for contingency theory. Moreover, it also reveals that an appreciation of the need to manage tensions is a key element of the change manager's ability to intervene, with any degree of success, in a developing organisational situation.

### b) The Psychological Contract

A second key element for consideration in the management of change in the area of quality management relates to the expectations of staff. This is of particular importance where there is a combination of uncertainty at organisational level and a degree of unpredictability in the external environment. This will often mean that academic and support staff are faced with circumstances which combine to produce conditions in which low morale, and a degree of alienation and resignation can flourish. In such circumstances staff perceptions of, and relationships with, senior managers are a key variable. In circumstances of turbulence and rapid change, concerns may be manifested in feelings of neglect by management, and of a lack of control and influence over strategy and policy matters affecting academic units.

In their discussion of leadership and management in higher education, Middlehurst and Elton (1992, p 255) cite Handy's notion of psychological contracts (Handy, 1993), described as sets of expectations, between individuals and the different sub-organisations to which they relate within the organisation as a whole. It is suggested that this idea of the psychological contract can assist in the present evaluation of the prospects and challenges for managing quality in FHE as colleges address the challenges of the new millennium. As Handy (1993) puts it:

> Just as in most work situations there is a legal contract between the organisation and the individual...so there is an implied, usually unstated, psychological contract between the individual and the organisation...We have a set of results that we expect from the organisation, results that will satisfy certain of our needs and in return for which we will expend some of our energies and talents (p 45).

From this I would argue that, with any change management initiative, alongside attending to context and climate of operation, it is essential to take full account of the expectations and values of staff. This in turn points to the need for effective communication to underpin leadership and management.

### c) Leadership, Communication and the Management of Change

Sallis (1994, p 237) argues that, while one of the principal functions of leadership in a college is to enhance the quality of learning and also to support the staff who deliver it, nevertheless:

> Leadership has not been given the prominence it deserves in the quality debate. There has been an overconcentration on quality systems and insufficient attention has been paid to the management of quality, and in particular to the nature of the leadership required to develop a quality college. A quality culture involves strong and purposeful leadership at all levels (p 238).

As is suggested in the discussion of 'the psychological contract', it is evident that leadership and management issues are particularly prominent in staff concerns during periods of uncertainty and rapid internal and external change. Linked to this are matters such as communication, vision and direction, and the management of change.

Though the specifics may differ, such problems will be familiar to anyone who has been involved in a change management or quality management role in education. One of the contributors to the 'Managing for quality' case studies (HEQC, 1995, p 80) lists the following elements as contributing to the leadership problems which he inherited, and which he describes in terms of recovering direction and morale in a changing climate:

- resistance to change (exacerbated by poor management)
- poor leadership
- feelings of alienation amongst staff.

By the same token, Partington and Brodie's (1992, p 6) description of a department which has strong leadership includes the following:

- all staff feel well treated
- their competence is respected
- initiative is recognised and rewarded
- staff support each other
- high corporate values are developed.

In the context of the present discussion of leadership, the reflections of the contributor to the 'Managing for quality' case studies (HEQC, 1995) again seem particularly pertinent to the two schools considered in the paper. He had inherited a group of staff who had been through a period of rapid and uncomfortable change with poor leadership from my predecessor (p 80). Moreover, in circumstances not dissimilar to those prevailing at NewColl, with the attempts to implement new systems, the case study author reports that:

> In a period of substantial change, in which the University's modular framework was put in place and the unit of resource was dramatically reduced, the staff were receiving no leadership and poor management...There was no unifying vision in the School, nor any means of the University's values being translated and communicated to staff (p 80).

Drawing on such material, two observations are offered here. The first draws once again on the 'Managing for quality' case study (HEQC, 1995). The contributor notes that, at his own university, just as had been the case at NewColl, there was a commitment to a management style which is based on consultation and development, rather than on the exercise of power (p

81). However, he also reflected on the difficulties involved: I am not fully confident that the University senior management is aware of all of [the] implications of the management approach which we are taking (p 81). In the second point I would concur with Meade (1997) who argues that leadership is important at all levels within an institution. He cites Leigh's (1988, p 18) view that leadership is not the exclusive preserve of the most senior manager, since in the modern organisation the autonomy of the individual must be a central focal point of management thinking. One of the implications of this is that, while academic staff are entitled to expect effective leadership, they too have a professional responsibility to use their relative autonomy or any responsibility devolved to them, to best effect. It is to such matters that attention turns now.

### d) Professional Autonomy or Professional Accountability?

One of the consequences of introducing change in the area of quality management and quality assurance systems, is that new policies and procedures are premised on assumptions about the need for new work practices and new internal accountabilities, with new demands being placed on staff. As can be readily illustrated by considering the reactions, in some quarters, associated with newly introduced quality assurance arrangements at NewColl, this may present considerable problems from a management of change point of view. Some staff displayed an element of conservatism and independence in quality assurance matters, and also looked to 'preferred' and 'established' ways of doing things. There was a strong inward-looking focus on 'the old system', with change initiatives and new quality management frameworks being associated in some quarters with de-professionalisation and a threat to autonomy.

Marris (1975, p 156) has used the experience of bereavement to understand such reactions to innovation and change in organisations. He notes that:

> people cannot reconcile themselves to the loss of familiar attachments in terms of some impersonal utilitarian calculation of the common good. They have to find their own meaning in these changes before they can live with them. Hence the reformers must listen as well as explain...If they impatiently cut this process short, their reforms are likely to be abortive.

Becher (1992) draws on Bailey's (1973) study of the effects of change in peasant studies to illustrate the position which the notions of academic autonomy and professional discretion hold in academic life. Bailey (1973, p 8) observes that the more ramifying the expected consequences of introducing an item into a system, the more difficult is likely to be its acceptance.

This discussion highlights the contentious nature of issues surrounding professionalism, professional responsibility, and accountability. Harvey (1995) has taken a very clear line on the importance of ensuring that, in the interests of continuous quality improvement, academics, as professionals, use their relative autonomy responsibly. Moreover, in his comparison of 'cloisterism' and 'new collegialism' Harvey (1995, p 35) depicts the former in terms such as 'traditional', 'isolationist', 'individual', 'defensive' and 'wary of change'. In contrast, the latter is seen as 'open' and 'responsive'. The 'new collegialist' academic 'welcomes change' and is open to 'explicit quality criteria'. As Harvey (1995, p 35) notes:

> New collegialism and cloisterism represent ends of a spectrum of positions and approaches to academia. Both tendencies can be found in most higher education institutions and in most discipline areas.

What Harvey points to here is that obtaining an appropriate balance between professional autonomy and professional accountability is an increasingly important feature of the management of change in FHE. These sentiments are echoed by Jackson (1998, p 8) in his discussion of the core characteristics of the self-regulating university. For Jackson, the 'professionalism' of the individual academic should be regarded as a key variable if self-regulation is to become established in the future college or university system:

> The health and integrity of the regulatory regime is, to a large measure, dependent on [a] sense of professional responsibility and obligation at the level of the individual (p 133).

There is an important message here regarding the need for institutional managers to take appropriate measures that will enable them to identify, respond to and manage reactions to change and innovation. Failure to do so will endanger aspirations to move towards a greater degree of self-regulation in quality assurance matters.

## IMPLICATIONS FOR LEADERSHIP AND MANAGEMENT PRACTICE IN THE NEW MILLENNIUM: MANAGING CHANGE, MANAGING TENSIONS

It is evident from the foregoing, that, insofar as institutional managers face a continuing task of reconciling the tension between accountability and improvement, and that, insofar as they are constrained by contextual realities, then the challenges of intervening purposefully and successfully in the complex and fluid organisational situations of the future are considerable. Even so, it has been argued that progress in the management of quality can be assisted, firstly, by conceptualising change and policy development in realistic terms and, secondly, by identifying and paying attention to what might be regarded as key factors in change initiatives. Towards this end, I have suggested that it is essential that managers understand their own organisations and that, moreover, they should take care to operate with a flexible approach to policy making and policy implementation and the management of change. Quality management, it is proposed, will always be affected by situational factors.

Reflecting the foregoing, it is possible at this juncture to set out a number of lessons for change management and management practice. The lessons to be drawn are as follows:

Lesson 1: There is a difference between the planned outcomes of policy and those which emerge through implementation

Institutional managers need to be alert to the emergence of an 'implementation gap' between what is designed into or intended for a policy, and factors which may prevent this from being achieved. This means that 'quality policy' is changed in the implementation process and that any quality management system or change initiative will always be impacted upon by situational factors. This points to the argument that the 'real makers of policy' are policy users (Prottas, 1978). In other words, in addition to focusing on the dimension of 'strategic management', it is essential to pay close attention to how policy is received and decoded.

Lesson 2: Quality management becomes preoccupied with accountability

A well-developed quality assurance system can provide a FHE institution with an anchor point and a stabilising influence in an often-turbulent environment. However, the requirements and expectations of the state, of external quality monitoring bodies, and other key stakeholders, mean that, in design and operational terms, 'quality' becomes linked with the exigencies of accountability. This can mean that quality systems may come to be viewed more in terms of 'technology' and 'discipline' than quality improvement or transformation of the learner. To help to counter this, it is necessary to achieve an appropriate balance between the professional autonomy of staff and the kind of professional accountability implied by the notion of 'new collegialism' (Harvey, 1995).

Lesson 3: There is no blueprint for quality management; what is achievable should not be viewed from the standpoint of a 'blank sheet'

While the desirable components of a quality system may not be difficult to identify, my research indicates that the search for a blueprint is flawed, perhaps even naive. There are a range of ways in which circumstances surrounding the design, development and implementation of a quality assurance system may serve to undermine or subvert an idealistic, blueprint-driven approach to quality assurance policy and change management. Managers do not begin with a blank sheet. As Fullan (1993, p 1) argues: "Change is a journey, not a blueprint". This is an important message for change agents as we face the challenges of the third millennium.

Lesson 4: To respond effectively to change, leaders must be able to pose the 'right' questions

Sporn (1999) has noted a range of internal responses, which have been triggered by external change within colleges and universities. She sets this in the context of a discussion of policy, innovation and adaptive structures. Her discussion raises issues around how institutional managers set about framing the questions which inform debate about strategy and future directions. Reflecting on changes in the recent past in the European context, she highlights three areas of particular interest. Firstly, the trend of restructuring, which now includes re-engineering and reform of academic and administrative arrangements. Secondly, the development of strategies to evaluate and improve quality in programmes and teaching, the purpose of which, Sporn argues, is not only to secure better accountability but also to provide a new basis for allocating resources more effectively. Thirdly, the transformation and redefinition of leadership, management and governance in colleges and universities with the importance of context becoming increasingly recognised in decision making and governance.

Looking to the future, the sorts of questions, which need to be addressed by FHE in the context of strategic quality management, may include:

- what is the appropriate structure for the college?
- how should academic processes and structures be (re-) configured?
- how should the curriculum offer and its mode(s) of delivery be changing?
- how far and in what ways will the staff base and staff profile need to change?
- how should quality assurance and quality control arrangements be evolved to
- reflect such change?

Lesson 5: To manage change effectively institutional managers should assess the current and emerging climate of operation and be prepared to manage tensions

A further lesson is that it is important for individual institutions to assess the current and emerging climate of operation. This means paying attention to the preoccupations of external stakeholders and regulatory bodies, and what they bring to bear at any one point in time, and also to the values and expectations of staff within an institution, 'the psychological contract'.

By focusing on 'climate of operation', managers may more effectively achieve 'alignment' (Child, 1984) between philosophy (quality culture), technology (quality system), and the realities of context (regulatory context). The general application of this is that by giving attention to alignment with prevailing circumstances, it is possible to ascertain what outcomes are most likely from what combination of external and internal constraining forces and opportunities, and also what approach to management might be appropriate.

## CONCLUSION

A central thread running through the paper has been the influence of context, the unpredictability of change, and the absence of simple prescriptions for successfully managing change projects. This prompts questioning as to whether managers should be regarded as 'change heroes' or 'passive victims'. The view taken here is that managers are neither one nor the other and that, even where turbulence and uncertainty predominate, organisations of FHE are not beyond purposeful intervention by managers. Through reflective practice, and self-evaluation more generally, a manager is able, through time, to develop an acute awareness of a developing institutional context and its climate of operation, and to respond meaningfully and purposefully on the basis of such an assessment. While the tension between 'accountability' and 'improvement' may not be fully resolvable, acknowledgement of such tensions can be a basis for intervening with purpose, since it provides a basis for understanding prior to design and intervention. This, it is argued, makes managers better equipped to deal with the challenges which they face as FHE enters the third millennium.

### Author's note

Details of the study institution, the respondents, and other non-essential details, have been changed in the interests of protecting the anonymity of the institution and the individuals concerned.

## REFERENCES

- Adair, J., (1983). *Effective leadership.* London, Pan
- Bailey, F., (1973). *Debate and compromise.* Oxford, Blackwell
- Becher, T., (1989). *Academic tribes and territories: intellectual enquiry and the cultures of disciplines.* Buckingham, SRHE/Open University Press
- Becher, T., (1992). *Making audit acceptable: a collegial approach to quality assurance*, Higher education quarterly, Vol. 46, No. 1, pp 47 - 66

- Burnes, B., (1996). *Managing change: a strategic approach to organisational dynamics*. second edn. London, Pitman
- Child, J., (1984). *Organisation*. London, Harper Row
- Cohen, M. D., March, J. G. and Olsen, J. P., (1972) "A garbage can model of organisational choice". *Administrative quarterly* Vol. 17, No. 1, pp 1 - 25
- "Corporate University Survey" (1999). *Corporate University Exchange*
- Fullan, M., (1993). *Change forces*. London, Falmer
- Geertz, C., (1973). *The interpretation of cultures: selected essays*. New York, Basic Books
- Handy, C, (1993). *Understanding organisations*. fourth edn. Harmondsworth: Penguin
- Harvey, L., (1995). *Quality assurance systems, TQM and the new collegialism*. Birmingham, QHE Project
- Harvey, L., (1996). Editorial, *Quality in higher education*. Vol. 2, No. 3. pp 177 - 184
- HEQC, (1994). *Learning from audit*. London, Higher Education Quality Council
- HEQC, (1995). *Managing for quality: stories and strategies - a case study resource for academic leaders and managers*. London, Higher Education Quality Council
- Hinings, C. R. Hickson, D. Lee C. Scheck, R and Pennings, J., (1971). "A strategic contingencies theory of intraorganisational power". *Administrative science quarterly*. Vol. 16, No. 2, pp 216 - 229
- Jackson, N., (1998). "Academic regulation in UK higher education: part III - the idea of partnership in trust", *Quality assurance in higher education*. Vol. 6, No.1, pp 5 - 18
- King, R, (1995). "What is higher education for? Strategic dilemmas for the twenty-first century university", *Quality assurance in education*. Vol. 3, No. 4, pp 14 - 20
- Kuhn, T., (1970). *The structure of scientific revolutions*. second edn., Chicago, University of Chicago Press
- Leigh, A, (1988). *Effective change: twenty ways to make it happen*. London, Institute of Personnel Management
- March, J. G. and Olsen, J. P., (1976). *Ambiguity and choice in organisations*. Bergen, Universitetsforlaget
- Marris, P., (1975). *Loss and change*. London, Routledge
- Martin E., (1999). *Changing academic work: developing the learning university*. Buckingham, Open University Press

- McNay, I., (1995). "From collegial academy to corporate enterprise: the changing cultures of universities", in Schuller, T. *The changing university*. Buckingham, SRHE/Open University
- Meade, P. H., (1997). *Challenges facing universities: quality leadership and the management of change*. Dunedin, University of Otago
- Middlehurst, R., (1991). *The changing roles of university leaders and managers: implications for preparation and development*. Sheffield, Universities' Staff Development Unit
- Middlehurst, R., (1997). "Reinventing higher education: the leadership challenge". *Quality in higher education*. Vol. 3, No. 2, pp 183-197
- Middlehurst, R. and Elton, L. (1992). "Leadership and management in higher education", *Studies in higher education*, Vol. 17, No. 3, pp 251 - 264
- Mullins, L. J., (1989). *Management and organisational behaviour*. second edn. London, Pitman Publishing
- Newton, J., (1999). "An evaluation of the impact of external quality monitoring on a higher education college" (1993-98). *Assessment and evaluation in higher education*. Vol. 24, No. 2, pp 215-235
- Partington, P. and Brodie, D., (1992). "HE Departmental leadership/management: an exploration of roles and responsibilities", *USDU occasional paper no. 3*, Sheffield, Universities Staff Development Unit
- Pettigrew, A. M., (1983). "Contextualist research: a natural way to link theory and practice", presented at conference, *'Conducting research with theory and practice in mind'*, Centre for Effective Organisations, University of South Carolina, Los Angeles, 3-4 November
- Pettigrew, A. M., (1985). *The awakening giant: continuity and change in ICI*. Oxford, Basil Blackwell
- Prottas, J. M., (1978). *The power of the street level bureaucrat*, Urban Affairs Quarterly. Vol. 13, No. 3
- Sallis, E., (1994). "From systems to leadership: the development of the quality movement in higher education", in Doherty, G. ed. *Developing quality systems in education*. London, Routledge

- Smyth, J. ed., (1995). "Academic work: the changing labour process in higher education". Buckingham., *SRHE/Open University Press*
- Sporn, B., (1999). *Adaptive university structures: an analysis of adaptation to socioeconomic environments of US and European universities*. London, Jessica Kingsley
- Trow, M., (1994). "Managerialism and the academic profession: quality and control". *Higher Education Report* No. 2. London, Quality Support Centre
- Watson, D., (1995). Quality assessment and 'self-regulation': the English experience, 1992-94. *Higher education quarterly*. Vol. 49, No. 4, pp 326-340
- Webb, A., (1995). "Two tales from a reluctant manager", in Weil S ed. *Implementing change from the top in universities and colleges: 10 personal accounts*. London, Kogan Page
- Weil, S., (1994). "Management and change in colleges and universities: the need for new understandings", in Weil S ed. *Implementing change from the top in universities and colleges: 10 personal accounts*. London, Kogan Page
- Williams, G., (1988). *Experimentation in reflective practice: a conceptual framework for managers in highly professionalised organisations*, presented at the annual conference of the British Academy of Management, Cardiff, 19 September
- Williams, G., (1996). "Taking up the HEFCW challenge", in Aylett, R. P. T. and Gregory, K. J. eds. *Departmental review in higher education: conference proceedings*. Goldsmiths College, University of London, in association with IBM, 20 March.
- Wilson, D. C., (1992). *A strategy of change: concepts and controversies in the management of change*. London, Routledge

TEND 2000

# Crossroads of the New Millennium

## Education Trends, Norms And Development

Prepared and Presented

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# Abstract

The paper addresses the relationship between fundamental changes, development policies, and technological advances leading to the globalisation aspiration. Fundamental aims of modern education are highlighted with emphasis on future proposals towards directing education to the work place. Globalisation impact on national culture and heritage is looked through with a view to invest in this service sector without losing achieved quality and national culture. The paper lays grounds for policy making and practical implementation of technological and vocational (further) education and human resource development and training.

# Education Trends, Norms and Development

## PURPOSE OF EDUCATION IN THE 21st CENTURY:

Educational institutions concerned in this paper are the usual categories of primary, secondary, higher (tertiary), advanced/theoretical professional, and practical/occupational systems. Emphasis is to be devoted towards the latter three categories for their serious effect in the individual, capacity building, national impacts, technological advancement and competition.

Higher education objectives have passed through different concepts throughout history. For example the purpose of higher education in the universities of Taxila and Nalanda in ancient India was to impart spiritual and mental skills to the students. Ancient Islamic universities observed similar concepts. Serving material well being was not an objective of ancient universities. These concepts have changed by time. Polytechnics were established in Europe towards the end of the eighteenth century to meet the needs of the society by training students in practical skills. Sanyal lists functions of higher education as follows:

1. Providing education and training within a structure integrating research and instruction.
2. Providing professional training.
3. Carrying out research in a broad range of disciplines and training qualified people for all fields of employment.
4. Playing a part in regional development and developing international contacts.
5. Fostering the intellectual and social development of society.

It is rather difficult stating the precise aims of education as presented in educational institutions. This is may be attributed to the high degree of decentralisation and fragmentation that exists within educational bodies and enterprises. In the era of globalisation and information revolution the goals could be reshuffled and summarised to include the following major aims of technological education in the 21st century:

- creation and dissemination of knowledge for all,
- national development and identity assertion, commitment to the country and training leaders in technology,
- spreading culture of the nation and promotion of peace and reduction of poverty,

- setting of education policies that address modern development and economic growth and national goals,
- internal coordination and professional behaviour,
- community and continuing education and awareness to promote participation in social and economic development and to prepare the work force to use technology for living and working by improving skills,
- conduct innovative, appropriate and sustainable applied and scientific research,
- formulation of appropriate administrative and strategic planning,
- improvement of academic outputs and quality control towards development of an entrepreneurial national economic system,
- fostering economic growth and adjustment,
- personal and social development and acquiring knowledge, active wisdom for the individual and the community,
- capacity building towards development and progress and team work structures,
- equal opportunities in education and training,
- flexibility and willingness to improve,
- addressing needs and inspiration of the handicapped, the infirm and the war causalities,
- keeping education ahead of industrial demand.

A substantial contribution to development and improvement in the education system should be achieved through changes in organisation, curricula and research objectives of the universities.

The major challenges that faces the implementation of the aforementioned goals and objectives include:

- fund raising and providing adequate resources to sustain education,
- efficient decentralisation of education system,
- appropriate educational institution management,
- continuity of student exchange programme services,
- technological change and global commercial integration,
- setting workable technological education strategies,

- involvement of stakeholders (students, staff, employers, governments, international community, professional associations and educationists) in education at all levels,
- shift of organisation of education from institution-centred to student-centred learning,
- development of a practical action plan for promulgation of regulations to encourage youth to join vocational training programmes,
- establishment of industrial production of teaching/learning training programmes and aids such as: audio-visual: video, TV and radio programmes, games and toys: lego and puzzle..etc.
- achieving a certain degree of excellence by making systems of learning more accessible, responsive, diverse, flexible, adaptable, empowering and affordable.

## FUTURE STATE OF EDUCATION

Due to scarcity of national resources, the trend nowadays in educational institutions is to shift from input control mechanisms to output quality control, and the shift from traditional education to training and on job education, with a tendency towards privatisation. More stress is to be laid over the establishment of applied research institutions to help development along the globalisation arena. This would call for strategic planning by educational institutions. This is to assess changes in the institution environment and plan for these changes in different short and long term perspectives, addressing economics, sociology, politics, culture, technological advancements, finance, available resources, management and administrative issues. This format ensures the introduction of:

- self regulation and accountability,
- introduction of courses that develop technological skills among people with sets of values,
- introduction of a good link between industry and operation of educational institution,
- improvement in educational quality outputs,
- research team work system and methodology,
- systematic analysis and problem solving,
- intensive utilisation of information,
- improvement of services and better utilisation of scanty resources,
- human development and capacity building,
- continuity of planning and evaluation patterns and norms,

- appraisal and accountability measures in research, academic matters, services, administrative and management issues,
- focus on human resources through training management and professional workshops and conferences,
- transparency in budget expenditure,
- education/business partnerships and ties in training service ventures for minimisation of use of scarce resources and expertise.

## LEARNING FOR THE WORKPLACE

Within the framework of needed revolution in education and embankment in the globalisation system of allowing trade in education with the proposals of the World Trade Organisation (WTO), addressing the following points deserves consideration:

- introduction of modular technological and vocational formal and non-formal education for disadvantaged social groups such as: school dropouts, unemployed personnel, and adults in employment or unemployment..etc.,
- introduction of needed courses and their continuous revision in technological and vocational education to meet the needs of industry and enterprises, and opening routes for life-long learning vocational education for graduates to pursue further university studies,
- flexibility in admission, training and graduation requirements and certification,
- work place training towards application of knowledge and performing practical tasks to fulfill work place roles (competence),
- career-oriented courses,
- introduction of credit/modular programmes,
- open and distance education,
- technology transfer and knowledge diffusion,
- creation of a better education/employment link to promote human capital development and competencies,
- establishing planning activities, teamwork, better analysis of information and use of technology.

## NATIONAL CULTURE AND TECHNOLOGICAL ADVANCES

Care should be taken when globalisation of the world economy and the swift development of technologies are addressed towards the following:

- use of technology in the service of education,
- staff morale, relevance, effectiveness, efficiency to make them a vital pillar in national productivity schemes and plans,
- brain drain,
- teaching staff not interested in management activities,
- staff having second jobs besides teaching and research,
- need to strengthen national research and development capabilities.

In most countries, education is provided free of charge or at prices not reflecting the costs of producing it. This is because education is considered a public, cultural, consumptive commodity up to a certain level and a social service rather than a productive activity. In most countries private education is highly subsidised. Cost sharing is another alternative to addressing university financing. Thus, there is a need to stress education for economic growth and launch investments in certain forms of educational technology. The private sector needs to participate in education by providing funds for endowment, research, and essential educational activities.

Creation and development of a national science and technology culture is vital to involve all community members young and old. This should be in full harmony with traditional culture prevalent in the society. The ultimate goal is to secure respect and promote best attitudes and values.

## GLOBALISATION OF EDUCATION

Investment in education within the frame of global format is an aim towards higher productivity and socio-economic development. Investment in this service sector can be made in the following possible avenues:

- computerisation,
- information systems and informatics technology,
- conglomerates of industries and educational institutions, and
- consultancy and applied research.

This would call for creation of more-business-like structures in educational institutions in accordance with sound and approved strategic plans. Measures that merit consideration in the globalisation of the format of education include:

- creating commercial activities and other sources of income generating activities as: information technology services, paid courses, consultancies, etc.,
- amalgamation to form larger local or regional units and centres of excellence,
- graduation in accord with job and market needs and national development,
- attraction of more support to education and research from industries and private sector,
- offering more autonomy for the individual educational unit in its domain of responsibility,
- expanding in introduction of private education,
- organising institutional networks to share facilities and materials,
- formulation and ensure the functioning of accrediting agencies,
- training faculty in new technologies for education,
- setting regional forums for assistance, expertise and experience share,
- building a better bond and linkage within the institution environment,
- upgrading the software of education programmes, interactive multimedia and education packages.

The points that warrant serious thinking when considering market oriented education services include:

- negative impact on culture of youth, children and women (foreign damaging culture),
- increase in the cost of education and market monopoly due to advances in techniques, programming and teaching aids and materials,
- lack of competition for local faculty, staff, technicians and advisers,
- launching of education programmes and degrees not in harmony with national interest and culture and in favour of regionalism or globalisation,
- attraction of research innovators and able youth to colleges that do not directly contribute to national culture and development plans,
- brain drain to developed countries and technically advanced domains,
- impact of non-national staff on nations culture, religion, beliefs and taboos,

The expected merits due to possibilities of trading in education services in the globalisation schemes contain the following:

- competition and novelty among institutional sectors,
- technology and knowledge transfer together with speed and ease of acquiring information, and its impact on society and learning systems,
- establishment of a prominent documentation, data and information national reference centre,
- flourishing of teaching and culture industry,
- introduction of national publications of education to the international media,
- introduction of vocational training systems that is relevant, flexible, efficient, effective and accessible,
- extending national values and culture,
- promoting industry - education link to enrich courses, improve educational skills, and excel workplace and output,
- improving education objectives and aims that address employer and market needs,
- maximising use of available resources,
- education bias towards science, engineering, vocational training, and technology to cope with modern development planning,
- offering educational institutions more autonomy to compete for funds, resources and candidates,
- continuous training and comprehensive and continuous teacher training.
- quality and excellence of academic and cultural output,
- helping students choose among education disciplines with full information about long term investment and trends and student orientation programmes.

## EDUCATION AND QUALITY CONTROL

Within the framework of quality control in education, the call would be directed towards excellence in academic and cultural inputs and the production of literate, numerate and flexible workforce. This is largely directed towards improving the quality of teaching and scientific research carried by the institution or a set task force. Quality measure and performance indicators, or peer review, may be used to show the institution's mission and objectives, or provide basis for granting funds, or serve as a tool in negotiation with respective authorities, and help in the monitoring and evaluation of approved policies and plans over time. These indicators may be grouped to entail the following:

1. subjective and qualitative performance indicators of inputs to the institution such as: student, staff or faculty, learning spaces, learning satisfaction, library, etc.
2. quantitative indicators of outputs such as: number and quality of graduates, research, publications, learning courses and fields etc.
3. efficiency indicators that relate to outputs and inputs like: student-years per graduate, student-staff ratio, costs per graduate students, research publication per number of staff, space utilisation. etc.,
4. quality indicators of the institution e.g.: examination success rates, employability of graduates, importance of publication and research findings, relevance and currency of curricula, professionalism of teachers. etc.,
5. process indicators which may include: satisfaction of learners, time for task completion, coordination between departments, departmental need satisfaction, fairness of student assessment, and progression and completion rate accreditation.
6. value for money indicators, which judge whether the service met the stated purpose and proved accountable to the funder, students, parents and employers.

The importance of having a performance indicator that is relevant, accurate, reliable, valid, available, timely and appropriate need not be stressed. This calls for the establishment of a regulatory standard accreditation body to shoulder the periodic evaluation of education courses, programmes, student admissions and records, and rankings of institutional performance.

The main objective of quality control regarding the rooting of better values among graduates is to initiate critical thinking, honesty, precision, self-reliance, job pride, professional ethics, and guarantee adequate training and economic competitiveness.

The careful selection and interpretation of the most suitable performance indicator needs to be stressed to achieve required balance and desired control

## FUTURE CHALLENGES FOR EDUCATIONAL INSTITUTIONS

Future challenges for educational institutions may encompass external and internal constraints:

External constraints may include:

- increasing demands in relation to diminishing public resources,
- share and distribution of authority and institutional management style,
- socio-economic interventions,
- accountability,
- education policy and planning processes,
- culture and tradition of institution,
- external links with institutions, enterprises and associations.

Internal constraints may incorporate:

- institution expansion (college or student increase),
- student performance, examination, progress under a transparent process,
- bilingual education policy to enable easy absorption of new technologies,
- curricula design, development, updating and upgrading its standards to meet needs, aspirations, and match the rapid technological changes,
- cultural values,
- unemployment of graduates,
- staff employment duration (a shift ought to be directed towards life-time employment),
- academic decisions and tasks and work load,
- remuneration packages,
- interaction, coordination between institutions, public sector, governmental and private authorities

## RECOMMENDATIONS

Based on the aforementioned discussions the following conclusions and recommendations are worth implementing:

1. Development of closer bilateral agreements or links, or twining between national, regional and international institutions to facilitate education, enhance independent

learning, exchange scientists, transfer and exchange technology and experience and face globalisation challenge. Links may be established with the Arab Industrial Development and Mining Organisation (AID), African Network of Scientific and Technological Institutions (ANSTI), UNDP, UNIDO, the World Bank, USAID, GTZ, UNESCO, ALECSO, AOTS, DANIDA, SIDA, Arab League (ALIC), Islamic Conference (IC), Gulf Co-operation Council (GCC). etc.

2. Strengthening collaboration and interactive work between educational institutions and industry through partnership to maximise use of the limited available resources.
3. Launching investment programmes in education to compete in the technological market and world trade.
4. Establishment of councils of professional and technological education to set targets and strategic education policies, promote national training, and develop link between educational institutions (primary, secondary, junior colleges and tertiary) trade and industry.
5. Stressing on national language to protect culture, ethnic roots and Islamic values.
6. Giving more attention to opening competent polytechnics and vocational training to supply required cadre to business, industry and the development of inventive and creative skills in talented candidates to master production process and compete in the world economy and market.
7. Stress on human resource development and training to bridge the gap between education system and science and technology under a financially appropriate long-term policy and strategy.
8. National government, private sector and NGO's should establish a National Technical Education Fund to speed up implementation and financing of action plans and policies.
9. Stress on advances through research to enlighten and strengthen policy, practice and experience. More involvement of private industries is required to invest in research and development (R&D) inline with governmental support

## REFERENCES

- COREVIP 99, Conference of Rectors, Vice Chancellors and Presidents of African Universities revitalising universities in Africa: Strategy for the 21st century, Arusha, Tanzania, 1 to 4 February 1999, Conference papers: Workshop on human resource building in science and technology, hosted by UNESCO and University of Dar-Es-Salaam.
- Council for trade in services, World Trade Organisation, Education services: background note by the Secretariat, restricted S/C/W/49, 23rd September 1998.
- Langlois, C., Universities and new information and communication technologies: Issues and strategies, European Journal of Engineering Education, Vol. 23(3), 1998, pp. 285 - 295.
- Report proceedings of the conference on technological education and national development, TEND 97, 6 to 8 April 1997, Abu Dhabi, Community Relations and Manpower Development, pp. 1 - 454.
- Sanyal B. C. 1992. Excellence and evaluation in higher education: Some international perspectives, Institute of Education, university of London, U. K.
- Sanyal, B. C., Martin, M. and D'Antoni, S., Institutional management in higher education 1999: Issues, trends and international experiences, module 1; Trends and international experiences, module 3; International Institute for Education Planning, IIEP Teaching materials, Paris, July 1996

TEND 2000

Crossroads of the New Millennium

# Higher Education And Development In Arab Oil Exporters: The UAE In Comparative Perspective

Prepared and Presented

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Seminar

# Higher Education and Development in Arab Oil Exporters:
# The UAE in Comparative Perspective

As all oil exporters in the Middle East, North Africa and throughout the world, the United Arab Emirates faces several dilemmas for its development and economic growth beyond the end of this millennium: (a) an increasingly integrated world economy in which technology and knowledge will be of paramount importance; (b) the challenge to diversify its economy from a natural resource-based economy that will inevitably decline in the century ahead; and (c) the challenge of keeping the state as a political community relevant to its citizens.

This paper suggests ways in which these difficult, and often seemingly contradictory, tendencies can be reconciled in ways that promote the long-term economic, educational and cultural/social interests of the U.A.E. Although several studies in the past have concluded that Arab oil exporters face insurmountable challenges in meeting these tendencies, this paper presents a more optimistic evaluation and argues that the United Arab Emirates can continue and expand making those appropriate investments in its educational system that will allow it to achieve economic diversification, to retain its economic well-being, and to foster a sense of national community among its citizens.

The basic assumption of this paper is that the appropriate educational policies, much like appropriate economic policies, can create comparative "niche" advantages in the changing world economy for small states like the U.A.E.--that can, in turn, guarantee a smoother transition toward a post hydrocarbon-based economy.

The basis for such an ultimately profound transformation—tailoring the United Arab Emirates' future workforce, economy, and citizens to a globalised economy—is outlined below. In essence, I argue that what is needed for the United Arab Emirates is a flexible set of educational policies that combine a more traditional technological education (already largely in place) with a more widespread curriculum centred around business administration (partly in place) and humanistic/social scientific approaches (partly in pace but separated from other aspects of education): technological education to assure that the country's citizens can control that part of the national economy that will dominate the economic landscape for the foreseeable future; business administration to assure the continuity of managing the technical capacity to competitively run such an oil-based and post oil-based economy in which other centres of world oil production and financial intermediation will come on-line; and, finally, a humanistic education that will help create and nurture generations of citizens whose sense of loyalty, nationalism and dedication to the country centre around the political and cultural institutions of the United Arab Emirates.

## BACKGROUND TO THE DEBATE ABOUT DEVELOPMENT IN HYDROCARBON ECONOMIES

Since development economics emerged as a distinct discipline, both economists and political economists have studied the impact of large and sudden capital inflows on Third World countries, and on hydrocarbon economies in particular. With almost no exceptions, their analyses and prognoses have been uniformly pessimistic. Economists have focused on the so-called "Dutch Disease" to explain the impact of economic booms: rapid increases in capital inflows bring about a highly inefficient reallocation of resources during the boom, and difficulties in adjusting during the following bust period.[1] Labour and capital flow from tradables into the nontradable sector, leading to de-industrialisation and contraction of the agricultural sector. Using standard trade theory, economists have argued that strong macroeconomic management—fiscal, monetary, trade and exchange rate policies—was needed to avoid these deleterious developments. But, until very recently[2] and although sensitive to the political costs their prescriptions entailed and obviously aware of the importance of local economic institutions to implement macroeconomic policies, they did not address the crucial issue of why some countries were willing and able to adopt these policies, while others were not.

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[1] Corden, Max (1984), "Booming Sector and Dutch Disease. Economic survey and Consolidations," Oxford Economic Papers, Vol.36,3; Roemer, Michael (1983), Dutch Disease in Developing Countries (Cambridge: Harvard Institute for International Development Paper, #156).

[2] Little, Ian, Richard N. Cooper, W. Max Corden and Sarath Rajapatirana (1993), Boom, Crisis, and Adjustment. The Macroeconomic Experience of Developing Countries (New York: Oxford University Press for the World Bank).

Political scientists have explained the same phenomenon in two distinct ways. Some,[3] and particularly those concentrating on the Middle East,[4] have argued that resource booms create rent-seeking societies without, however, clearly specifying how these interests are articulated or institutionalised, or how they promote or slow down institutional development. Comparative political economists in general have been sceptical of constructing theories of economic adjustment across cultural boundaries. They contend that since this cultural setting is subject to constant change, individuals or groups do not express long-term strategic behaviour within institutional settings. Not surprisingly, therefore, most "regional" investigations of the impact of resource booms have been single case studies, and the few that were truly comparative were restricted to a single region.[5] Although I accept that elements of these interpretivist and cultural approaches can help elucidate the context and the process within which economic responses to resource booms in countries like the United Arab Emirates take place, I discount them as determining that process

A second group of political scientists has been more sensitive to the role of economic and political institutions in particularly hydrocarbon societies, but has generally restricted itself to observing that resource booms create certain types of (primarily distributive) institutions—meant to provide patronage by dividing the state's burgeoning income through subsidies, interest-free loans and hand-outs—at the expense of extractive and regulatory ones, traditionally used to tax and to implement welfare policies.[6] These studies argue that the result of "boom behaviour" is contradictory: although the state seemingly gains in power, resource booms systematically undercut states' long-term ability to regulate local economies as economic decisions increasingly reflect political objectives—primarily the need to provide sustained patronage. The resulting lack of consistent regulation ultimately makes effective macroeconomic management and long-term development impossible as the institutions in charge become highly politicised and lose their autonomy.

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[3] Karl, Terry (1997), The Paradox of Plenty: Oil Booms and Petrostates (Berkeley: University of California Press); Skocpol, Theda (1982), "Rentier State and Shi'a Islam in the Iranian Revolution" Theory and Society Vol. 11, 3.

[4] Mahdavy, Hossein (1970), "The Patterns and Problems of Economic Development in Rentier States: The Case of Iran," in M.A. Cook, Studies in the Economic History of the Middle East from the Rise of Islam to the Present Day (Oxford: Oxford University Press); Beblawi, Hazem and Giacomo Luciani eds. (1987), The Rentier State (New York: Croom Helm).

[5] Chaudhry, Kiren (1997), The Price of Wealth (Ithaca: Cornell University Press).

[6] Anderson, Lisa (1986), The State and Social Transformation in Tunisia and Libya, 1830-1980 (Princeton: Princeton University Press); Vandewalle, Dirk (1998), Libya Since Independence: Oil and State-building (Ithaca: Cornell University Press).

In an ongoing study that investigates economic growth and educational issues in Morocco, Indonesia, Malaysia, Yemen and Singapore, I argue that these assumptions and findings do not necessarily hold in all cases, and that responses of particularly hydrocarbon societies to inflows of revenues are much more complicated and diversified than many authors have previously argued. In particular, based on management studies undertaken in countries outside the Middle East, I would argue:

- The nature and varying characteristics of the resource boom—oil in the case of the United Arab Emirates and most other Middle East and North Africa (MENA) countries—alone are not sufficient to explain why some countries nurture macroeconomic institutions and promote long-term economic growth while others adopt a wasteful "potlatch" mentality.

- Contrary to what has been argued, the type of political regime has little impact on whether or not macroeconomic institutions or efficient economic growth proceed, or are at least protected from persistent political interference. Some modern authoritarian states are not better at insulating those institutions than more open and/or traditional political regimes that are normally seen as sacrificing long-term economic efficiency for more immediate political gains while others, like Indonesia, manage to create and sustain high levels of autonomy.

- The specific type of resource boom and the degree to which their revenues accrue directly to the state or not provide few clues to the state's ability to create autonomous macroeconomic institutions. Where remittances provided the bulk of revenues, as in Yemen, macroeconomic management proceeded. In Nigeria, where oil and natural gas revenues flowed directly and exclusively to state coffers, it failed dramatically. In Indonesia, under roughly similar circumstances, it did not: the government promoted the autonomy of macroeconomic policy institutions and maintained economic growth after the 1973 Pertamina scandal.

- Although "thick description" remains necessary to understand the cultural background in which macroeconomic institutions emerge, cultural explanations of economic development do not adequately convey the varying and changing roles of those institutions in that process. There is, however, an important cultural factor—education and the creation of a sense of citizenship related to it—that intricately links culture to development. Indeed, in most of the so-called "developmental states" in Southeast Asia, the link between education--and more particularly the role the state plays in intermediating between the local society and the country's economy through its educational system—and development itself is much more subtle and multi-layered than previously acknowledged.

## A FRAMEWORK OF ANALYSIS: EDUCATION, DEVELOPMENT AND STATE ACTION

My primary interests for the purpose of this paper and conference converge around two distinct questions:

- How do states compete in a rapidly changing international economy where traditional factors of endowment no longer automatically provide a comparative advantage?
- How can states—particularly economically vulnerable states, such as those based on hydrocarbons--maximise their chances in a world economy where they are primarily receivers/consumers of trade and technology and not its producers?

In answering both questions—and in identifying the role education and the state play in this process—it is necessary at the outset to emphasise the potential weaknesses of countries like the United Arab Emirates: they have a particular vulnerability because of

a) the nature of their economies;
b) the size of their economies in a world economy where size and related efficiency still matter; and
c) their relative inability to affect the governing mechanisms and institutions of that changing world economy.

In effect, my argument is that for states like the United Arab Emirates, a viable economic future is both a real race against time that can only be won if an integrated triangle consisting of educational policies, state actions and the maximisation of economic opportunities are pursued. This "iron triangle"—to use the economists' and sociologists' language—can provide to countries like the United Arab Emirates a viable "window of opportunity" during which it can create for itself a "niche" in an international, globalised economy. The challenge is to get from a resource-rich, capital-rich economy, with a good educational system and a government that has understood the challenge both development and its link to education pose, toward an economy that is nimble enough to identify far into the future—and furthermore on a continuous basis--trends, difficulties, and opportunities for creating a specialised position in that globalised economy. In other words, I perceive, in the United Arab Emirates, all three essential legs of the triangle in place (see particularly the Appendixes to this paper which compare the social, economic and educational indicators of roughly similar small oil exporters in MENA and, for comparison purposes, Singapore, a so-called developmental state.)

The challenge therefore becomes both somewhat more limited, more narrow, but also, ultimately, somewhat more difficult: to integrate those existing legs into a mutually supportive triangle. Furthermore, this challenge as I analyse it is not purely technical or even overwhelmingly economic (although both remain very important), but includes a whole host of human (indeed humanistic) and societal challenges that need to be more fully addressed.

After almost half a century of development economics, it is by almost a cliché by now to repeat that human capital constitutes one of the crucial sources in the developmental future of nations.7 As Nobel laureate Gary Becker wrote, "research in recent years has increasingly appreciated that both economic growth and inequality are closely dependent on investments in different forms of human capital"8.

In all countries, but particularly in non-western developing countries, education has become the prime vehicle for social stratification—and general awareness of this has been part and parcel of politics in these countries. An additional issue in countries like the United Arab Emirates is that, because of state spending and the centrally accruing nature of resources, the state itself, rather than individual groups, are able to influence this social stratification. Thus

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[7] For a more recent contribution to the literature, focused particularly on the United States, see Robert B. Reich (1991), The Work of Nations: Preparing Ourselves for 21st Century Capitalism (New Yokr: Alfred A. Knopf) . One of the by now classic works is by Nobel prize winner Gary S. Becker (1993, third edition), Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education. Notice that Becker's first edition was published in 1964, almost four decades ago.

[8] Becker, 255

education, and access to education, ultimately becomes a powerful political issue if it is perceived as discriminatory. But it can equally be perceived, and used by the state, as a deliberate mechanism to foster growth, equity and greater equality, in ways that resonate with the Arab and Muslim legacy of its culture.

The danger to countries like the United Arab Emirates therefore is not, I believe, as some observers would have it, that the state will become irrelevant in its totality.9 It is rather that states are already selectively losing control over aspects of their economies within the global economy10 which, in turn, could have important social and political implications that need to be in place as part of the "iron triangle."

This greater integration of the international economy necessitates as well greater porousness of educational systems to create what Robert Reich has called Symbolic Analysts—cadres of young people, armed with highly developed symbolic-analytic skills necessary to run information-driven economies.11 As Reich abundantly implies, these type of communities, for numerous reasons, will remain the most developed in the West, particularly the United States, and—an important political implications for countries like the United Arab Emirates to consider--access to these communities will remain crucial to all other states interested in retaining a competitive edge. The result is that the pursuit of this particular strategy carries with it very important implications for openness, for intercultural contact and, almost

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[9] The literature on globalisation is by now endless. Among this plethora, see William Greider (1997), One World, Ready Or Not; The Manic Logic of Global Capitalism (New York: Simon and Schuster) and Jerry Mander and Edward Goldsmith eds., (1996), The Case Against The Global Economy And For A Turn Toward The Local (San Francisco: Sierra Club Books). Among some of the more apocalyptic scenarios of what globalisation could mean—and why it is bound ultimately to fail—see John Gray 1998), False Dawn (London: Granta Books). For a trenchant critique of Gray's book, see Razeen Sally, "XXXXXX"

[10] See Peter Dickens (1998), Global Shift: Transforming the World Economy Global Shift: Transforming the World Economy (New York: The Guilford Press), and, in a more liberal vein, World Bank (2000), Entering the 21st Century: World Development Report 1999-2000 (Washington: The World Bank) and World Bank (1997), Global Economic Prospects and the Developing Countries (Washington: The World Bank).

[11] Reich, 225-240.

inevitable, for questioning local cultural and social restrictions that prevent the implementation of a purely technocratically-based pursuit of an economic strategy.

In the last few years, education experts as well as economists, sociologists and political scientists have started to pay increasing attention to knowledge-based factors that can create comparative advantages in the global economy for local economies, considering the growing importance of technology itself, of business processes, of information, of quality control, and of creating corporate responsibility and corporate competence. All these processes are part of what can more structurally be called the emergence of knowledge capitalism.12

It is ironic that, despite this new awareness, knowledge remains one of the most undervalued of all economic resources. What is even more ironic is that even those who stress knowledge acquisition often see as a neutral-free process, whose adoption or pursuit does not need to be coordinated with the aspirations of local societies and their governments. After extensive research and inquiries about the Asian Miracle—where the success of development strategies hinged crucially on states being "developmental", i.e. local states "embedding" themselves within local societies in ways that helped promote initially efficient and advantageous development strategies—much of these lessons were seemingly lost when the Asian Crisis emerged.13

In a world where regions and even individual cities can create comparative advantages for themselves with the correct mix of local initiative and state support—think of the electronic industry in Bangalore and the emergence of a host of "technopolises" around the world—it is clear that economic and development processes have dramatically been altered in the last few decades. But the underlying processes of development within these individualised cities and

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[12] Alan Burton-Jones (1999), Knowledge Capitalism: Business, Work, and Learning the New Economy (Oxford University Press).

[13] Among an enormous literature on the emergence and crisis of the Asian developmental model, see Alice Amsden, Alice (1997), Asia's Next Giant: South Korea and Late Industrialisation; Wade, Robert (1994 Governing the Market: Economic Theory and the Role of Government in East Asian Industrialisation; Jomo, K.S. (1990), Growth and structural change in the Malaysian economy (New York: St. Martin's Press). For the notion of "embedded" development, see Peter Evans (1995), Embedded Autonomy: States and Industrial Transformation (Princeton University Press).

regions, or within smaller city-states like Singapore and Hong Kong (although the latter's experience is certainly not transferable as whole cloth to the United Arab Emirates), carry important lessons for (a) what possible strategies to pursue and (b) what to avoid.

Economic development therefore, more than ever before, carries with it an internalised as well as an externalised dimension that particularly smaller countries like the UAE and other oil exporters must pursue. A crucial dimension of both processes will be flexibility, knowledge, accurate forecasting, lifelong learning, and a sophisticated pool of local citizens—and all these must be based on an underlying consensus within each state of what development should look like, and what particular kind of social contract with its citizens the state wants to maintain.

The central issue in this paper therefore is what combination of knowledge-based and more materially and culturally based combination of development will yield the greatest benefits for the United Arab Emirates and its citizens. The terrain it covers is necessarily broad—although it encompasses more specific suggestions—and involves a synthesis of concepts and ideas generated and discussed within several disciplines.

Perhaps a take-off for the discussion can be one of the sentences taken from the TEND conference brochure prepared for this conference: ""'Students are seeking training, which will improve their competitive edge when they enter the work-force." It immediately raises a number of affiliated questions that put the sentence into context: What students are we talking about? What training will improve their competitive edge? And, perhaps most importantly, what will the work force look like when they enter it? One could add a number of equally valid questions beyond those: What will constitute a competitive edge? A competitive edge for what? How do you create a "niche," a comparative advantage, as a small oil exporter in a global economy over which you have little control?

These kinds of questions have engendered an impassioned debate in the West and in several of the Newly Industrialising Countries. Let me for the conference's purposes suggest, by way of background, one way of analysing the ongoing changes in the world economy since the late 1980s. Most of them can be categorised into a fourfold, "quadruple transition" that is underpinned by a new "information technology paradigm"[14] First, a transition from regimes of accumulation based on mass production to more flexible forms of production, scope economies, innovation rents, and differentiated patterns of consumption (i.e. a shift away from what is known as a Fordist economic system).[15] Second, within industrial sectors, a transition from basic manufacturing to new information and high technology industries. Third, a shift from a manufacturing-based industrial society into a service or "post-industrial" society. Fourth, a transition from an international to a globalising economy that functions along electronically-integrated, intra- and inter-form networks and alliances.

More important for our discussion these fundamental changes have been underpinned by the development of new modes of regulation in the international economy. The Keynesian welfare state—although its variant is still present in Malaysia, and in some form in other developmental states—with its promotion of full employment (through demand management and new forms of collective consumption) is now giving way to the so-called "competition state" that is oriented toward improving the conditions of supply in a national economy, in order to make it an attractive site for investing financial and productive capital "Such institutions and policies help to promote product, process, organisational, and market innovation and to enhance the structural competitiveness of the economy, while subordinating welfare policy to the demands of competitiveness and labour market flexibility."[16]

What is clear from this discussion is that appropriate educational policies are assumed to be in place—that every nation can move toward its own appropriate "niche" and where the state emerges in a role somewhere halfway between the Keynesian interventionist and the post-

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[14] See, in particular, Manuel Castell (1996), The Rise of the Network Society (Cambridge: Blackwell Publishers)

[15] See the essays in Ash Amin, ed., (1984), Post-Fordism: A Reader (Cambridge: Blackwell)

[16] I want to thank my colleague James Shoch here whose ideas have been instrumental in making me think through some of the implications of post-Fordism for individual countries like the UAE. The quote is from his forthcoming book, Party Politics and Trade Policy: The US Since 1980 (University of North Carolina, 2001). For a further elaboration of the notion of the competition state, see Bob Jessop, "Towards a Schumpeterian Workforce State? Preliminary Remarks on Post-Fordist Political Economy," Studies in Political Economy, No. 40, Spring 1993, pp. 7-39.

Fordist hands-off rational actor. In most countries, however, these assumptions do not hold. Countries like the United Arab Emirates must worry about creating long-term competitive advantages, since in the short term they cannot really affect how "competitive" they are (except through a cartel action that temporarily delivers more money and alleviates the problem).

One crucial dimension—beyond the purely economic—concerns the role of the state therefore in the "iron triangle I drew before: economic growth (based on technology and a knowledge-based economy); the notion of citizenship (and challenges to that sense of citizenship through globalisation that diminishes a sense of identity); and, finally, the state itself which must face up to a changing relevance and attractiveness among its citizens. One of the crucial dilemmas of this new, globalising economy will be the dilemma of competing loyalties: citizen versus the state, the state versus globalised markets and the pursuit of a purely "technologised" education versus a more traditional and humanistic tradition that resonates both within the culture of the United Arab Emirates and within the more global context in which its economy operates.

This, in part, will demand a great deal of creativity by the state's managers. Not only to worry about the economic viability of the state in a future setting, but also to install into its citizens a sense of relevance and attractiveness for the state itself. This is a difficult for any state: the concept of not only creating "homo economicus" or a well-educated citizen, but also to create a citizen who truly feels s/he belongs to the nation in ways that go beyond purely economic interests. Education and good stewardship in this regard go hand in hand--and the United Arab Emirates, during this relatively early period of its existence as a state, has constituted a good example that a combination of both sets of policies is policies. But further on the horizon are the questions posed by the emergence of the "competition state" that will inevitably challenge some of those achievements. Education therefore, in a broad, humanistic sense, will, in addition to its more narrow technical sense, be a crucial dimension and measure of how far along the United Arab Emirates will move toward that newly emerging economic reality. While there is no reason to be alarmist—on the contrary—the globalising economy and the structures it imposes on individual countries like the U.A.E. bears paying close attention to.

## CONCLUSION

Like other oil exporters where economic activity is almost necessarily restricted to specific economic tasks in the international economy, and where the source of state revenues is a finite resource, the UAE's economic future will be tied to the continued development and maintenance of a knowledge-based economy. This type of economy demands that the fundamental and traditional relationship between work, learning and education be constantly re-appraised, and necessitates the creation of coalitions between local economic productivity, the country's educational organisations and the state itself. This triangle of interlocking elements must be subject to constant and flexible arrangements that simultaneously meet the expectations of the country's citizens and allows for a social contract that fully incorporates those citizens in the operation of both state and economy.

As detailed in this paper, these types of flexible and constantly changing arrangements are difficult to implement, even in developed and so-called developmental economies where the state has consciously created links that allow it to become embedded within local societies while promoting economic strategies that reflect national objectives and are capable of retaining the strong social cohesive ties that make for developmental states.

As a small economy and an oil exporter, the UAE has already made substantial steps in its short history to meet some of these challenges. As made clear in the Appendices, the country compares favourably against many similarly sized economies in the region. But, as the implicit comparison to Singapore makes clear, the real challenge is to create a diversity of economic life, and a supporting technological, educational, social and cultural structure that allows the UAE to even more fully emerge as a different type of developmental state for a very different international economic system in the future. I would summarise those challenges briefly as follows:

1. To ascertain that the state remains relevant beyond distributive largesse; indeed, to ascertain that the perception of the state as ultimate provider of economic activity disappears.
2. To clearly discern and pursue appropriate economic objectives within the narrow economic activities that are possible and available.

3. To create an educational system and educational opportunities that both maximise chances at economic success and are instrumental in creating citizens that meet the educational and socio-cultural criteria necessary to provide meaningful employment.
4. To create, within one of the appropriate government ministries—or as a separate organisation—an institution that fully plans for the country's future, not only in the strict economic sense but also in the broader, more inclusive sense of an economic/social/cultural community.

The challenge of education therefore in the UAE, as in all countries, but particularly those that are potentially particularly vulnerable because of their relative size or the non-diversified origin of their income, is a multidimensional challenge: the problems of education itself to meet the goals of the local economy into the future; the challenge of educating the state to flexibly respond and initiate proposals and policies that maximise the UAE's chance at sustained development; and the problem of pursuing both within a climate that maintains and strengthens the national sense of identity among its citizens. Faced with these challenges, the UAE faces no particularly difficult or insurmountable problems; how well it fares far into the future, however, will depend in large part on its skill and willingness to address those challenges simultaneously.

TEND 2000

## Crossroads of the New Millennium

# A Challenge For Teachers And Students In The 21st Century: How To Cope With Personal Ignorance And Generate Knowledge In An Information-Centred World

Prepared and Presented

By

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## Workshop 1

# Abstract

The information explosion and the exponential development of information-accessing tools has a disempowering effect on many people. It continually confronts them with the enormous imbalance between what they don't know and what they feel they really know and understand. A major challenge of the information-centred world is for both students and teachers to learn how to assert responsibility and control over personal practice. This challenge may require personal reconceptualisation of thinking, feeling and acting, with respect to each of three aspects of teaching and learning: Values and Beliefs; Intentions and Purposes; Approaches and Behaviour. In this presentation, findings from some long-term educational research projects are used to present a conceptualisation of how teachers and students may operate to increase students' willingness and ability to take enhanced responsibility and control over their own learning. Each aspect of teaching and learning above will be considered in relation to some selected key constructs, and workshop activities will enable participants to apply the ideas in practice, and to seek coherence between the aspects in order to guide personal practice.

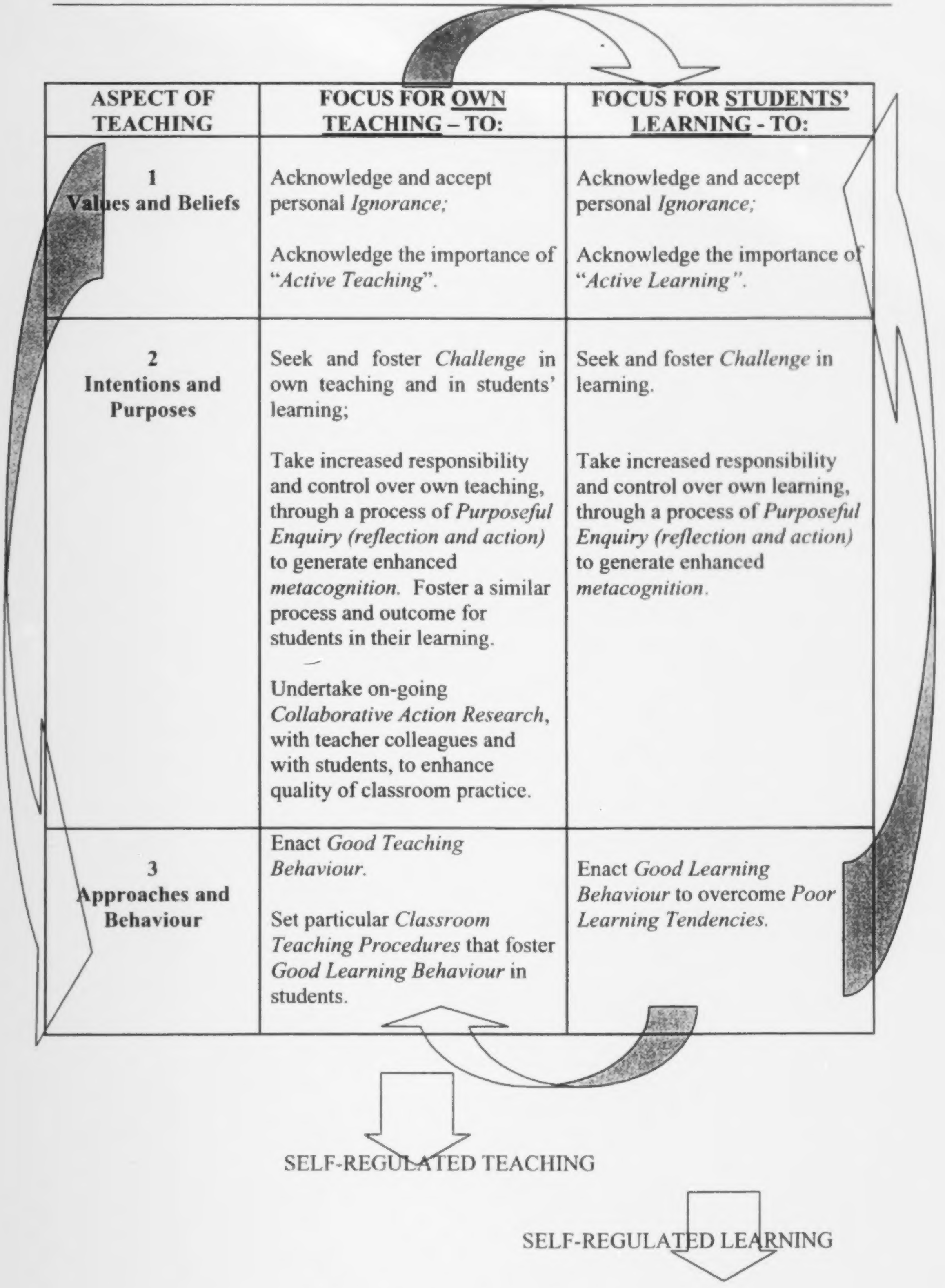
This paper provides an outline to consider and discuss a conceptualisation of quality in teaching and learning. The conceptualisation builds upon findings from collaborative, school-based research between practising school teachers and university academics over a more than fifteen year period, mainly in Australia but also, in the last six years, in Sweden and Denmark. The major research project concerned is the Australian *Project for Enhancing Effective Learning* (PEEL) and its Swedish version, PLAN *(Projekt för Lärande under eget Ansvar)*. Space here does not permit detailed description of the nature of this research, which is available elsewhere (e.g. Baird and Mitchell, 1986; Baird and Northfield, 1992, Baird, 1999). Instead, some fundamental ideas that arise from the research will be summarised by means of some key figures that will serve as the focus for the discussion.

The principle figure is Figure 1 below. This figure emphasises the importance for quality practice of coherence among three aspects of thinking, feeling and acting during teaching or learning. These aspects, entitled *Values and Beliefs*, *Intentions and Purposes*, and *Approaches and Behaviour*, are shown, together with some major ideas or constructs related to each aspect. Some of these ideas and constructs will be discussed in detail: for Values and Beliefs - *Ignorance* and *Active Learning*; for Intentions and Purposes – *Challenge* and

*Metacognition*; for Approaches and Behaviour – *Good Teaching Behaviour, Good Learning Behaviour*, and *Classroom Teaching Procedures*.

# A Challenge for Teachers and Students in the 21st Century:

## How to Cope with Personal Ignorance and Generate Knowledge in an Information-Centred World



| ASPECT OF TEACHING | FOCUS FOR OWN TEACHING – TO: | FOCUS FOR STUDENTS' LEARNING - TO: |
|---|---|---|
| **1<br>Values and Beliefs** | Acknowledge and accept personal *Ignorance;*<br>Acknowledge the importance of "*Active Teaching*". | Acknowledge and accept personal *Ignorance;*<br>Acknowledge the importance of "*Active Learning*". |
| **2<br>Intentions and Purposes** | Seek and foster *Challenge* in own teaching and in students' learning;<br>Take increased responsibility and control over own teaching, through a process of *Purposeful Enquiry (reflection and action)* to generate enhanced *metacognition.* Foster a similar process and outcome for students in their learning.<br>Undertake on-going *Collaborative Action Research*, with teacher colleagues and with students, to enhance quality of classroom practice. | Seek and foster *Challenge* in learning.<br>Take increased responsibility and control over own learning, through a process of *Purposeful Enquiry (reflection and action)* to generate enhanced *metacognition.* |
| **3<br>Approaches and Behaviour** | Enact *Good Teaching Behaviour.*<br>Set particular *Classroom Teaching Procedures* that foster *Good Learning Behaviour* in students. | Enact *Good Learning Behaviour* to overcome *Poor Learning Tendencies.* |

SELF-REGULATED TEACHING

SELF-REGULATED LEARNING

Figure 1: Integrating Thinking, Feeling And Acting in Teaching and Learning

Next, some features of each aspect will be considered in turn.

## ASPECT A (VALUES/BELIEFS): IGNORANCE AND ACTIVE LEARNING

### Ignorance

One crucial value or belief is to acknowledge and effectively remedy *Ignorance*. As will be discussed, ignorance - not knowing something or how to do something - is a common feature of learning, but one that may generate significant negative metacognitive, affective, and volitional implications. Some types of ignorance are considered below, but a term crucial to effective learning should first be defined: this term is *metacognition*. I define metacognition as having three components: *metacognitive knowledge* (knowledge of the nature of learning, effective learning techniques, and personal learning characteristics); *metacognitive awareness* (of task nature and progress - essentially knowing what you are doing and why you are doing it) and *metacognitive control* (making productive decisions about approach, progress and outcomes) (e.g. Baird, 1991). As will become clear, metacognition is a key component of self-regulated learning, where learners are both willing and able to take responsibility and control over personal practice.

Ignorance is important because it is commonplace for all of us; indeed, it is more commonplace to be ignorant of something than to truly understand it. As important as ignorance, however, is whether or not you are aware of it. Sometimes you do realise that you don't know something, sometimes you are unaware of it. Knowing that you don't know or can't do something is prerequisite to effective learning. Indeed, it signifies one aspect of *metacognitive awareness* that, in turn, is necessary for metacognitive control over learning. Alternatively, you may not know that you don't know or can't do something. In this situation, you are metacognitively unaware - a term that has been entitled secondary ignorance. Thus, primary ignorance, not knowing something or how to do something, is cognitive; secondary ignorance, unawareness of this lack of knowledge, is metacognitive.

Undesirable learning situations may be associated with both metacognitive awareness and unawareness of cognitive ignorance. Many metacognitively aware students may be disinclined to act to convert their ignorance into understanding. The basis for this inaction is often affective rather than cognitive – the learner mistakenly relates ignorance with stupidity, and consequently decides not to reveal ignorance for fear of appearing foolish.

The other undesirable learning situation, where the learner is metacognitively unaware of the nature and extent of personal cognitive ignorance, is one of inadequate willingness and ability to achieve desirable learning outcomes. One type of metacognitive unawareness is when you don't realise that you don't know or can't do something. This unawareness may arise from inaccuracy - for instance, when you think you know what you are doing when in fact you don't. This situation often involves the setting of unproductive learning goals. A similar but different type of metacognitive unawareness is if you don't know whether you do or don't know something (you can't call the information to mind, even if only temporarily). Here, motivation would be expected to be low and emotions negative, because you don't know what to do next.

The need to acknowledge and remedy ignorance has been accepted by many PEEL teachers in how they construct their classroom environments. The central focus of promoting a climate of inquiry by fostering and reinforcing students' question asking necessitates action to preempt any pejorative reactions if students reveal personal ignorance or uncertainty. Thus, many PEEL teachers promote a climate in which it is "O.K. not to know" by enforcing rigidly a classroom rule of never permitting "put downs". Further, teachers set out to provide opportunities for students to practice applying strategies to identify and deal effectively with task-centred and learner-centred ignorance, as will be discussed.

### Active Learning

There would be few teachers who would not value *Active Learning* highly for promoting desirable educational outcomes. The nature of such active learning – what it is, how it is exemplified in the behaviour of students - remains problematic for many teachers, however. In Table 1, I propose four major types of active learning (1, 2a, 2b, and 3) and arrange them taxonomically. These types differ in the level of reflection-driven enquiry by the learner, the breadth of such reflection, the levels of metacognitive awareness and control, and the extent of learner self-regulation. I argue that, over time and task, desirable learning subsumes all four types, but that many teachers limit their aspirations for their students' learning to the lower levels of the active learning hierarchy.

Table 1: Proposed Four Types of Active Learning

| Type Of Active Learning | Nature of "Active" in Active Learning | Major Strategy | Reflection | Metacognition |
|---|---|---|---|---|
| 1 | Receptive; Compliant | Answering questions | Uniformly low | Limited at best to metacognitive awareness of whether specific content is known. Essentially no metacognitive monitoring or control |
| 2a | Curious: task-centred | Asking questions to find out knowledge required to complete task component | Focus exclusively upon task component | Clearly task-determined. Awareness and control narrow in scope. |
| 2b | Curious; task-centred | Asking questions centred upon completion of whole task. Questions are broadly strategic and managerial | Focus on progress through task. Broader in scope than for Type 2a. | Clearly task-determined. Awareness and control concern general task completion. |
| 3 | Curious: learning-centred | Asking questions that evaluate nature, purpose, and progress of learning | Reflection situates task within general learning context | Related to taking responsibility and control over learning, and setting worthwhile general learning goals. |

Type 1 is clearly distinguished from the higher types. For Type 1 Active Learning, the term "active" connotes compliant attention and application to the work, but such application is limited to answering questions or completing tasks set by the teacher. For this type, to be active is to be conscientious and busily engaged, but not, in Bruner's term, "to go further than the information given". In contrast, Types 2 and 3 learning centre upon proactive, purposeful enquiry that is initiated by question asking. Increasingly in these levels, activeness connotes curiosity - a striving to make sense - that fosters personal responsibility and control over personal practice. The types of active learning included in Table 1 provide an important frame for distinguishing PEEL teaching from other types of teaching, as will be mentioned later.

## ASPECT 2 (INTENTIONS/PURPOSES): PERCEIVED CHALLENGE

An important intention or purpose for all teachers is to motivate students so as to "get them on task"; to be willing participants in what is to be done, and to set worthwhile learning goals. A construct that emerged from a four-year Australian project entitled *Teaching and Learning Science in Schools* (TLSS; e.g. Baird, 1994) provides a perspective for setting motivation within a frame for teacher action. This construct is perceived Challenge, that comprises both a thinking (cognitive/metacognitive) Demand component and a feeling (affective) Interest/Motivation component (Baird, 1994). Students want to be challenged by the work they do but, for a task to be perceived by the learner as productively challenging, both Demand and Interest/Motivation must be at desirable levels. The TLSS research demonstrated that various classroom factors influence extent of perceived challenge. These factors include amount, difficulty, and novelty/variety of the work, extent of physical and mental involvement, and opportunities to choose nature of topic and activity (Baird and Penna, 1997).

## ASPECT 3 (APPROACHES/BEHAVIOUR): GOOD TEACHING BEHAVIOUR, GOOD LEARNING BEHAVIOUR, CLASSROOM PROCEDURES

### Good Teaching Behaviour

In teaching, a teacher enacts classroom behaviour (Aspect 3) that reflect his or her underlying pedagogical attitudes, values and beliefs (Aspect 1), operationalised in terms of general teaching purposes and specific task-related goals (Aspect 2).

In this section, I summarise some research that focuses upon teachers' conceptions of behaviour that characterise "good" teaching. For PEEL teachers, it might be expected that such behaviour would be those that foster students' metacognitive awareness and control over personal practice and thereby lead to enhanced understanding and enjoyment. What do other teachers believe? For both types of teacher, conceptions were elicited through their responses to a questionnaire. An analogous questionnaire explored students' conceptions of quality.

Almost 400 practising teachers (PEEL teachers; non-PEEL secondary teachers; tertiary teacher educators) and teachers-in-training responded to a questionnaire that listed 72 classroom behaviour. Respondents prioritised each behaviour according to one of three categories: as **Crucial** to good teaching; as **Desirable but Not Essential** for good teaching; as **Not Significant or Relevant** to good teaching. Additionally, teachers who either were active PEEL teachers, or knew about PEEL, picked their "top ten" behaviour - those that they considered especially important for PEEL teaching.

Of the overall 72 behaviour, a mean of between 44 and 50 (depending on the respondent group) was scored as crucial for good teaching! This result emphasises the complex and multiple nature of quality teaching. PEEL-related teachers' priorities for the most important behaviour for good PEEL teaching were, in rank order:

- Takes risks in teaching in order to trial better techniques
- Employs a range of teaching strategies
- Promotes a reflective attitude by students to themselves and their work
- Promotes linking of ideas in learning (e.g. through concept maps)
- Actively promotes conditions where students can ask questions
- Caters for individual differences among students; tries to extend their learning and understanding
- Is flexible - changes teaching approach/strategies as required
- Encourages and supports students
- Shows respect for students and their needs and concerns
- Demonstrates enthusiasm for subject and the work done
- Uses strategies that foster students' self-esteem and confidence

These behaviour can be categorised as: those with a significant *cognitive/ metacognitive (thinking)* component; those with a significant *affective/prosocial (feeling)* component; those with a significant *volitional (acting to follow something through)* component. According to this categorisation, of the twenty behaviour selected most commonly, 9 items were significantly affective (e.g. "Encourages and supports students"), 4 were significantly volitional (e.g. "Is flexible - changes teaching approach/strategies as required"), and 7 were significantly cognitive/metacognitive (e.g. "Promotes linking of ideas in learning"). In terms of the PEEL project, this result provides corroboration of the central desire of many PEEL teachers to stimulate students' *willingness* (13 items) and *ability* (7 items) to reflect about their learning.

A revised teacher questionnaire was completed by 127 teachers at 10 schools. None of these teachers was a PEEL teacher or had any significant knowledge of PEEL. Thus, results from this questionnaire provide an interesting view of teaching from a general, non-PEEL, perspective. For these teachers, the twelve items considered to be most important of all in characterising good teaching tended towards instruction/management/organisation rather than the nature of student learning or students' learning needs:

- Encourages and supports students
- Provides clear purposes/ instructions for work to be done
- Demonstrates enthusiasm for subject and the work done
- Maintains class discipline
- Doesn't "put down" any student
- Uses language that students can understand
- Regularly monitors students' understanding and gives regular, appropriate and prompt feedback on progress
- Employs a range of teaching strategies
- Has high (but potentially achievable) expectations of students
- Applies discipline fairly

Finally, a student questionnaire was completed by almost 1,700 Grade 7 - 11 students in thirteen Victorian government and independent schools. The items chosen by students most commonly as important for good teaching were:

- Encourages me in what I try to do
- Makes me feel it is always O.K. to ask questions in class
- Helps me to understand what I am supposed to do and why
- Speaks in a way that I understand
- Shows a thorough understanding of the topics he/she teaches
- Encourages me to believe that I can do the work
- Encourages me to think carefully about the work I am doing
- Expects me to achieve as much as I can
- Doesn't put me down

- Gives us tasks to do that make us think in a variety of ways
- Pays attention to what I say or do in class

From the student' viewpoint, therefore, actions taken by the teacher to directly assist them, cognitively and affectively, in their learning are the ones that they value most highly.

**Good Learning Behaviour and Desirable Classroom Teaching Procedures**

In discussion, I will describe some key "*Good Learning Behaviour*" (GLBs) that PEEL teachers have tried to encourage in their students. Application of these behaviour help students to achieve good levels of metacognitive awareness and control over learning, and generate enhanced self-confidence. It will be noted that such behaviour markedly emphasise active learning types 2 and 3, rather than type 1.

PEEL teachers have attempted to stimulate such GLBs by systematically applying particular *classroom teaching procedures*. Examples of such procedures will be considered in the discussion, in order to demonstrate how a teacher may organise his or her teaching in terms of a "learning agenda" for the students, whereby students undergo progressive development in their competence and confidence in learning.

## QUALITY IN THINKING, FEELING AND ACTING: SELF-REGULATION AS A GOAL FOR EDUCATION

Based upon findings of PEEL over fifteen years and data arising from complementary projects as TLSS, the conceptualisation of quality teaching and learning presented above highlights the multiple nature of these processes and, particularly, the integration of thinking (cognition/metacognition), feeling (affect), and acting (e.g. volition) for both self-regulated teaching and self-regulated learning.

Usually, good teaching constitutes purposive action - it is the product of a thoughtful, considered, approach. In this article, I have argued that good teaching requires productive integration of three aspects of teaching: Values/Beliefs; Intentions/Purposes; Approaches/Behaviour. Such integration is difficult as it requires the teacher to clarify and articulate fundamental elements of professional thinking, feeling and acting.

In summary, the PEEL project provides some insights into the nature of quality teaching and how such teaching may be enhanced. It informs us about the nature of self-regulated learning, both by students as they learn and by their teachers as they teach. Three inter-related features stand out: the teacher developing a long-term strategic *teaching* agenda, based directly on progressive developments in students' *learning*; this teaching-for-learning agenda involving the promotion of *active learning* types 2 – 3; these attempts by teachers to improve learning occurring through collaborative action research with other teachers. Such learning will directly assist students in the 21st Century to develop the competence and the confidence to effectively replace personal ignorance with understanding.

## REFERENCES

- Baird, J.R., (1991). "Individual and group reflection as a basis for teacher development." In P. Hughes (Ed.), *Teachers' professional development.* Hawthorn, Vic: Australian Council for Educational Research.
- Baird, J.R., (1994). "A framework for improving educational practice: Individual challenge; Shared Adventure. " In J. Edwards (Ed.), *Thinking: International and interdisciplinary perspectives.* Melbourne, Hawker Brownlow Education.
- Baird, J. R., (1999). "Reflecting, Teaching, Learning". *Perspectives on Educational Achievement.* Cheltenham, Victoria: Hawker Brownlow Education.
- Baird, J.R., and Mitchell, I. J. (Eds.), (1986). *Improving the quality of teaching and learning: An Australian case study - the PEEL project.* Melbourne: Monash University Printery Services.
- Baird, J.R., and Northfield J.R. (Eds.), (1992*). Learning from the PEEL experience.* Melbourne, Monash University Printery Services.
- Baird, J. R., and Penna, C., (1997). "Perceptions of challenge in science learning". *International Journal of Science Education* 19, (10), 1195-1209.

TEND 2000

Crossroads of the New Millennium

# Funding Problems Of Technical Education In Developing Countries

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Workshop 1

# Abstract

During the last decade, funding mechanisms for Universities and Technical Education Institutions/Colleges have undergone a massive restructuring in both developed and developing countries. A common factor in this restructuring has been a gradual reduction in governmental support and consequently greater reliance on either fee based education or on creation of privately sponsored Engineering/Technical Colleges or even Universities.

This Presentation will look at the effect of these changes towards funding scenario of Technical Education in the new millennium by analysing following points:

1. Trends of funding systems in the developed world.
2. Trends of funding mechanisms in the developing world.
3. How Universities and Technical Education Entities are going to survive in the changed scenario?
4. The effects of privatisation, commercialisation and marketing on the academic quality and financial balance sheet.
5. Effect of funding crisis on the societal structure of the humanity.

The Presentation will cover experiences of funding management in Australia, New Zealand, U.K., USA, India, Papua New Guinea, Singapore, Philippines, China, Kenya and Arab countries.

# Funding Problems of Technical Education in Developing Countries

During the last decade, funding mechanisms for Universities and Technical Education Institutions/Colleges have undergone a massive restructuring in both developed and developing countries.

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## ECONOMIC REALISM

Before we start discussing the nitty-gritty of relationships between funding problems and quality of education, it is better to clarify as to what we mean by the developed and developing countries.

According to my analysis, after the collapse of communism in most parts of the world, there are now only two realigned economic blocks:

- Developed Block consists of those rich/advanced countries where government provides basic Social Security (or Welfare) Support System (SS Net) for its population. This block consists of about 20 countries located in North America, Australia, New Zealand and relatively well-off countries of Western Europe.
- Developing Block consists of those countries where there are no or almost nil SS Net, i.e. when a person is unemployed, the government does not provide basic human survival needs of food and shelter. In these countries, unemployed people have immense problems of filling their and their families' stomach and their first priority is to satisfy their hunger for food and place to live. They would care the least about the other non-essential esoteric issues like quality of life and even quality of education.
- This Non-SS Developing Block consists of all remaining countries in Africa, Asia, Latin America, Central and Eastern part of Europe, numbering over 200.

Oil-rich Arab countries are much better-off than their neighbours in Asia/Africa because of strong governmental economic support and full employment for the Arabian population. I am not very sure whether the governments in Arab countries provide SS Net for their population or not.

Problems of funding management and quality assurance of technical education programmes in developing countries are entirely different than those in developed, rich or advanced countries.

Therefore, it is proposed to raise the debate on Technical Education at the global economic level and examine some of the issues facing developing and poorer countries in managing and improving the quality of engineering education in their countries.

## FUNDING SYSTEMS IN THE DEVELOPED WORLD

In advanced/rich countries, most of the educational funding (primary, secondary, tertiary, technical, etc.) is provided by the respective governments largely based on student numbers. Exception to this general scenario is USA, where most of the world famous Universities and Centres of Learning were established and are still funded by private individuals and a collective pool of endowment funds, like Harvard, Cornell, Stanford, etc., Universities.

However, during the last few years, governments in these rich countries, especially in Australia, New Zealand and U.K. have cut the education funding and forced the Universities and Technical Colleges to go in for private fee-based funding in order to augment their resources.

The quality of education provided in these countries is very good and is monitored mainly by professional bodies, who are generally free of governmental or political interference.

## FUNDING SCENARIO IN DEVELOPING COUNTRIES

For the general public in these developing countries, any engineering or technical degree or diploma certificate is a passport to lifelong wellbeing of himself or herself and his/her extended family. Therefore, the demand for such qualifications is very high and it is almost a rat race amongst school leavers to get into these engineering/technical colleges. These people will leave no stone unturned to gain entry and pass these courses.

Because the problems of funding and quality are different in larger countries than those in smaller countries, it is proposed to divide developing countries in two groups as below:

- Large countries having a population of more than 10 million
- Small countries having a population of less than 10 million

### Large Countries

Universities and Educational Institutions in these countries were initially (in some countries about 600 years back) established by their governments or by their colonial administration and government funding continued for the educational sector till about the 1980s. After the collapse of communism and dominance of market driven economies, in many countries of Central and Eastern Europe and also in Asia like India, Philippines and Indonesia, private sector educational funding is gaining ground.

In view of the aforesaid booming demand, there are hundreds of privately funded Engineering/Technical Colleges in countries like Philippines, India, Thailand, etc., besides the usual state funded ones. These private Colleges are run as business entities and are largely fee based.

As there are now so many of these private Technical/Engineering Colleges, a bit of market driven competition comes in to play. Those who can maintain a good quality of education are attracting better students and can also demand higher fees.

In the present age of internet and computers, private Colleges or Institutions offering good quality information technology education are doing extremely well and will continue to survive in the new millennium as long as this cyber boom continues.

It is extremely difficult to ensure good quality in this mushrooming high demand scenario. Educational quality of most of the central government funded Universities and Institutions, say in India - is still very good but many other state or provincial government owned Universities and Institutions are not in very good shape. Amongst the privately run Colleges and Institutions, as mentioned above, the market decides as to which entity is good or bad.

Quality in all educational institutions in these countries is usually maintained by government operated bodies, which are open to political influence and many times, their decisions are not very objective. Thus, the problems of accreditation and quality assessment is extremely difficult and complex in these large developing countries such as India, Philippines, Indonesia, Thailand, etc.

Education in the tightly controlled economy of China is still largely state funded with practically little or no role for private sector educational involvement. Quality in all Engineering/Technical Colleges is also largely undefined and is monitored by state controlled bodies.

Some African countries have also started to establish private Colleges and Universities and presently there are a few private Universities in Kenya. Education funding is largely a state monopoly in most of the Arab countries, especially those having large oil resources. Quality is also monitored by state appointed entities in these countries.

## Small Countries

There are also many very small poorly resourced developing countries where there is only one engineering school and/or two-three technical colleges. Products of these schools/colleges work only in their own country and educational globalisation has little or no meaning for them.

For example, in a country like Papua New Guinea, there is only one Degree based Engineering School in a Technical University and there are 5-6 Technical Colleges that produce Diploma, Associate Diploma and Trade Certificate qualified students in technical areas. All these are largely funded by the government, and funding is being reduced every year due to budget constraints.

However, during the last ten years, a number of privately - run business colleges have propped up, which offer courses in Business, Accounting and Computing - requiring minimum laboratory facilities. The situation is similar in other smaller countries like Fiji, Brunei, etc.

Quality and accreditation has little or no meaning in these small countries, where the number of Technical Colleges offering technical education is extremely limited and it is difficult to compare one from the other. Quality is mainly driven by market forces and employers decide as to which student is bad or good. The name of the college or institution has a very small relationship with quality, because of the monopoly of these colleges in their own field of operation.

## SURVIVAL IN THE NEW MILLENNIUM

Looking into the past decade's trend of funding technical and IT orientated educational entities, it would be obvious that private funding will play an increasing role in the coming decades in both developed and developing countries.

Market driven economic scenarios are also becoming popular in almost all countries as old state controlled operations, rules, and regulations slowly crumble and disappear. Therefore, in the new millennium, quality management of educational entities will also move away from state bodies to independently minded professional bodies and societies.

Employers will demand products of good quality and in a totally market driven culture, poor and badly run educational entities will fail and only the good ones will survive.

## COMMERCIALISATION OF EDUCATION

As governments around the world cut back in education funding, commercial and private entities will take a greater role in educational business. Education is slowly becoming a Service Industry similar to Banking, Insurance, Travel, etc.

As privatisation and commercialisation of education continues, marketing of good quality education will become a dominant force in world markets.

Recent examples of aggressive education marketing are those mounted by Australian and British Universities in countries like Singapore, India, Malaysia, etc.

Educational marketing in itself is becoming a big industry. Therefore, now there are many conferences, workshops and educational trade shows being organised by respective embassies, consortia of Universities and specialised education export companies.

Australia now earns about US$ 4 to 5 Billion per year from its education export and attracts a large number of full-fee paying students, mostly from Asian countries.

Many universities in developed countries continuously look over their balance sheets and try to maximise their incomes through admitting larger numbers of fee-paying foreign students.

Upkeep of the quality of education in this free-for-all scenario will become extremely complex as we move along from state controlled quality monitoring to objectively minded professional quality monitoring. Professional bodies and institutions like Institutions of Engineers or Accountants or Lawyers will play a more dominant role in enforcing quality in both government-run and privately funded educational entities. In the ultimate analysis, when the economies become totally market driven, survival of the fittest and best will automatically ensure good quality both nationally and internationally.

## FUNDING CRISIS EFFECTS

The effects of funding crisis (due to cuts in governmental education budgets) vary from country to country based largely on presence or absence of the Social Security Net (SS Net). SS Net was defined in Section 2 of this Paper.

In advanced/rich/developed countries, governments fund almost 90% of all educational expenses of all students. Students and/or their families have to pay little or almost no fees to attend schools, colleges or universities. The education is almost free for all this population. Therefore, although the governments in these countries are cutting educational funds, it has practically no effect either on quality of education or on the living standards of local population because the cuts in governmental funding are being compensated by export and commercialisation of education and by the admittance of larger numbers of full-fee paying foreign students. This scenario is common in Australia, New Zealand, USA, UK, Canada, etc.

The effects of funding crisis and privatisation are much more pronounced and deep rooted in developing countries. In India, for example, fees in the government-run Colleges and Universities are very low but fees in private Colleges and Institutions are very high and therefore place a very heavy burden on the families. It is becoming extremely difficult for an ordinary Indian family to give good quality education to their children because of the high fees charged by private colleges and extremely limited number of places available in the low fee government-run colleges. This scenario is similar in other large developing countries like Philippines, Indonesia, Thailand, etc.

In small developing countries like Papua New Guinea, all University and Technical Education was totally free in the past, and the government even used to give a pocket allowance in cash to all tertiary students. Since 1996, the government abolished the pocket allowance and started charging 10% of the fee to students or their parents. For poor families in far-flung villages, it is extremely difficult to pay even this US$100 fee per year. The government wants to increase this fee contribution to 25% or more but is facing immense resistance from the local population, who is hard pressed at meeting their basic needs in poor economic conditions.

As is clear from the above analysis, education is slowly coming out of its ivory tower existence and is trying to find its place in the wider market place by extending its reach in different countries through different means to survive and expand.

## CONCLUSIONS

The following points emerge from the above analysis:

- Export of education will become an important component of the economies of advanced/rich countries like Australia, New Zealand, U.K. and Canada.
- Privatisation, Commercialisation and Marketing of education, especially business, commerce, and information technology will increasingly play a dominant role in developing countries.
- Quality management in developing countries will also move away from government monitoring to professional monitoring; as is now the case in developed countries.
- The quality of education in developing countries, in the long run, will be determined by market forces. Quality educational entities will attract better students and will also be able to charge higher fees.
- Educational funding from the individual family budget in developing countries will become increasingly difficult in the privatisation scenario as fees will increase.
- Universally, education will move away from being a totally governmental activity to a more commerce and industry based activity and wil, in the course of time, become a Service Industry similar to banking, finance, insurance, travel, etc.

TEND 2000

## Crossroads of the New Millennium

# The Application Of Continuous Quality Improvement Models And Methods To Higher Education: Can We Learn From Business?

Prepared and Presented

By

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**Monday 10 April, 2000**

**Workshop 1**

# Abstract

This paper examines some of the influences that created the demand for putting the quality back in education. Using a hybrid business / education model the author discusses how this model can be applied to the ever changing environment of Instructional Technologies.

# The Application of Continuous Quality Improvement Models and Methods to Higher Education: Can we Learn from Business?

## QUALITY IN EDUCATION, WHEN DID WE START TO CARE?

The search for "quality" in education was a reaction to the increased consumerism of students in the 1970s and their critique of the education "product". This was analogous to what the American automobile manufacturers experienced in the 1960s when in ignoring the Japanese competition when they thought they had a controlling market share. The Japanese entered the market with what the consumers wanted the result was disastrous for the Americans. The lesson learned was; "give the customers what they want", not what we think they should have. This sense of complacency was not the error of only industry but also academe.

The prevailing attitude of some administrators in the early 1980s was that students were to be seen, not heard. The materialistic “me” generation and an older student population introduced a consumer oriented student on campuses that were in search not of "knowledge" but of a money degree. Good grades would get them into a prestigious graduate school and then a high paying job. The term “deferred gratification principle” was coined during this time. Tuition costs rose every year, students graduated with diplomas and an $80 - $100,000.00 USD debt from easy to obtain student loans. These loans had to be paid off over many years. This put more pressure on students to not waste time and start earning money as soon as possible.

Universities were not prepared to deal with this new type of attitude. Undergraduate classes were large; lecture sections of 500 were not uncommon on large campuses. Quiz sections with teaching assistants had 20 to 30 students meeting several times a week. Teaching assistants (TAs) worked for free tuition and many were not native English speakers. The American graduates were off campus, either on the job or had gone to other schools for advanced degrees. As a result, a large number of foreign teaching assistants entered the campus workforce in the late 1970s.

Many "new" students were adult returning students and had very high expectations of a "quality" return for their investment of time and money. Students with difficult courses found they could not understand their quiz section leaders (TAs). Students under pressure to get good grades now had another obstacle to their goal. The new consumers of the education “product” did not accept this passively as before. There were protests on campuses. Laws were passed in state houses, policies were formulated and new departments formed to deal with this crisis. Special training programmes for teaching assistants who couldn't speak English were developed and as well as for professors who couldn't teach. This was a process that took years to identify, develop and establish. There were millions spent to find a solution and millions were wasted on the wrong solutions. The university had lost touch with their "customers" and had suffered the consequences. The quest to find out what went wrong, fix it and make sure that it wasn't repeated started.

## "QUALITY" ON CAMPUS

Quality Control was something that was only lightly considered before these developments and not for academic departments. Discourse on quality was reserved for service businesses and assembly lines. This was, however, exactly what the schools were in need of. University schools were similar to the medieval guilds where each guild (school) had their own members, codes, evaluations and methods of governing and hadn't realised they were out of touch. Tradition was no longer relevant to students, they were much more practically driven. Students felt the university was out of date and out of touch. Business and Industry thought the same and established training systems to orient new employees to real world needs and best practices.

## BUSINESS / INDUSTRY AND LEARNING TECHNOLOGIES

Business is training oriented, not education oriented. The focus, by necessity, was much more practical and applied. Certificates not degrees became more important and training time was considered "down time" or wasted time. This created a need for only very practical approaches to training and the application of technology-based tools. Computer Based Training (CBT), Multi-media and now Web-based or Online Learning have come out of the need to find more efficient and effective ways to develop and deliver training. These are the tools of today and meet today's needs. Schools needed to realise the "New Paradigm" for learning and that flexible learning environments are a reality. Are our schools ready for this type of challenge? Without a well thought out strategic plan and CQI Model, I think not. The exercise of developing technology-based learning systems does a great deal to clarify standards and content for a course. Business has known this for many years. In academe many decisions that were not made or left in the "gray area" of management and curriculum design were clarified with this rigorous process of fitting loose processes into a technology. The application of technology became like the famous "Procrustean Bed" of Greek mythology. The processes must be "cut" or "stretched" to satisfy the technology. No half measures or gray areas are allowed. This was the case with processes and delivery of course content. Course content delivered at the whim of the instructors who liked to over emphasise their favourite topics was no longer an option. Technology demanded standards, regulated the scope and sequence of a curriculum and guaranteed coverage of the required skills and knowledge.

## THE HYBRID OF EDUCATION AND BUSINESS IN QUALITY CONTROL MODELS

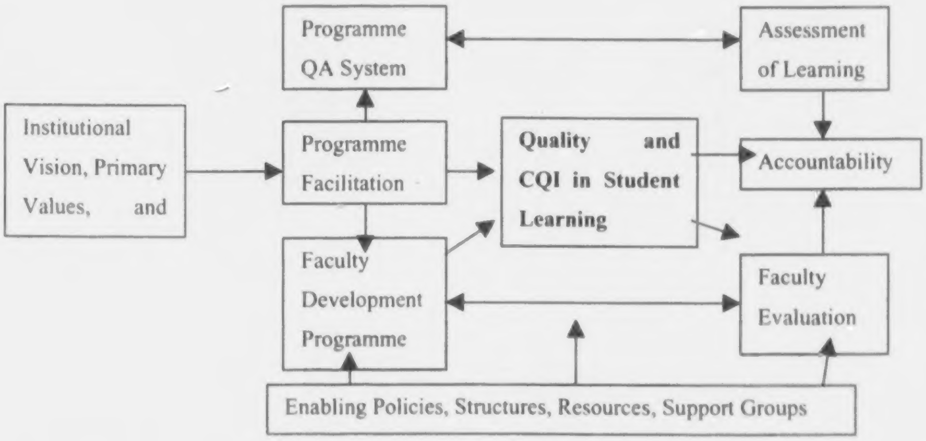
Continuous Quality Improvement models from business have found their way into education. They "bought their way in" by identifying specific needs. Some of these needs identified in business were:

1. Sharp increases in the costs of material, energy and labour.
2. Increased competition among companies in saturated or dwindling markets.
3. Changing customer values and more exacting quality requirements.
4. A need to introduce more products more rapidly.
5. A need to lower the breakeven point.

Academe found many similarities between the factors influencing business and the factors causing schools to rethink their academic "business" model. An academic version of the above list might look like this:

1. Increases in the costs of faculty and staff wages, operational costs, buildings, land and energy.
2. Increased competition from private schools, non-traditional modes of learning, e.g.; online learning, distance learning, certificate programmes.
3. Changing values of the students, the students knowing what they need for success in the world of work and demanding it from the school.
4. The need to keep up with the requirements to design, develop and implement new programmes in a timely manner, when the demand is high.
5. The need to maximise the return on income from the tuition to student ratio. Keeping costs down while quality and demand are maintained.

As a result, an academic version of CQI was developed. An Educational-based Quality Assurance Model would look like this:


Programme QA System
Assessment of Learning
Institutional Vision, Primary Values, and
Programme Facilitation
Quality and CQI in Student Learning
Accountability
Faculty Development Programme
Faculty Evaluation
Enabling Policies, Structures, Resources, Support Groups

(Boyle, 1997)

**"QUALITY CONTROL DEALS WITH THE QUALITY OF PEOPLE." (IMAI, 1986)**

This macro-model for "Quality and CQI in Student Learning" represents a comprehensive approach for strategic planning and management of the "educational product." Some specific ways in which this model should be updated are the following:

1. The Institutional Vision, Primary Values and Goals must take into account the strategic implications of using technology-based educational solutions; cost to own or lease equipment, telecommunications costs, support, training of faculty and students on new technologies, short and long term plans, goals for converting traditional curriculum to a technology-based curriculum.
2. Programme Quality Assurance System must include quantitative and qualitative links to the "new learning environments" created by the technology. Conclusions and recommendations should affect both the macro and micro level of programme design and development.
3. A faculty development programme must include both technical and non-technical training necessary for the incorporation of technology into the curriculum. This must also be closely linked to Faculty Evaluation. "Faculty development activities and programmes need to be designed and facilitated strategically so as to lead to quality improvement in programmes, and programme improvement initiatives need to enable faculty development."(Boyle, 1998) A school that wants to promote technology should include a performance measurement for faculty related to how they have worked to incorporate

technology and new methods into their courses. This incorporates the "humanware" aspect of business and CQI.

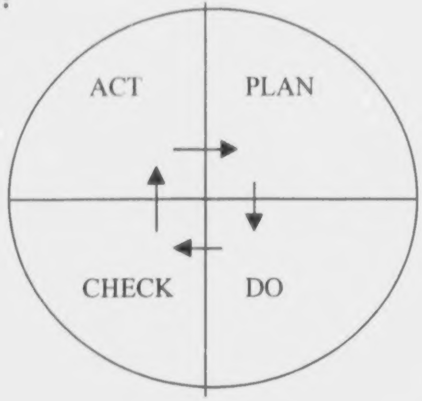
4. Assessment of learning is now possible from a distance as well as in the classroom. As we look at more case-based or problem-based curriculums we will be using different types of assessment models. Competency-based as opposed to knowledge-based or "recall" based assessments will help to measure how well students have applied the knowledge and skills that they have acquired in class. The new learning environments allow discussion and collaboration in a synchronous or non-synchronous (asynchronous) mode.
5. Enabling policies, structures, resources and support groups need to be developed for technology to be effective. Policies regarding attendance need to be redefined, traditional models may not be applicable to mature students who are working, have a family and are trying to pursue an advanced degree. Reporting structures between departments and centralised technical support groups need to be redefined and clarified.
6. Support groups that are cross-departmental and cross-functional need to be formed to discuss quality from several different facets; fiscal, instructional, technical, administrative and strategic.

Other changes that must be made for this model to keep current are the following:

- This must not be a "once a year" exercise but a continuous effort.
- The department or organisation in charge of quality must report to the highest level of the school administration and have the "clout" to initiate change.
- Strategic planning for the school must include technology use and implementation as one of its major goals. Technology should not be treated as a separate item on its own but as an integral part of the overall process.

**THE DEMING WHEEL IN EDUCATION:**

(Imai, 1986)



The Deming wheel is the most famous model in CQI. This is at the core of all CQI models. The interrelationship of continuous planning, doing, checking, acting and starting the process over again serve as the basis for most applications of CQI.

1. Planning based on previous information or experience and through the collaboration of either "Teaching Learning Roundtables" or Quality Circles.
2. "Doing" or implementing the improved process which has been defined through the planning step.
3. Checking to see if the process improvement has had the desired effect. Using quantitative and qualitative measures to determine efficiency and effectiveness.
4. Act on identifying a new process or re-examining the current process to identify opportunities for change. Then starting over again on a new process or to further refine the previous process.

The improvement of curriculums and instruction through new teaching and learning technologies and methodologies is an on-going or living process. It must be a continuous and always dynamic activity. The marriage of CQI and Learning Technologies is a logical and correct approach for the deployment and success of these programmes. Schools must take a more business-like approach to how they manage their product development and implementation.

The best uses of technology must be promoted and refined through the CQI process:

- Self-paced learning
- Standardisation
- Any time / any place learning
- Reduced operational costs, after the initial investment
- Increasing "virtual group" or "virtual team" skills in students. This emulates how work will be done in the future.

## CONCLUSION

CQI has had some success in education but it must be applied properly using the same standards that business has developed. This is not an academic exercise but a necessity to survive in the modern world.

Schools will have to compete internationally, not only regionally from now one. Universities are launching programmes to sell their degrees (products) to the world through Distance Learning technologies. Britain has announced recently a new government supported programme to start the first e-university, which could award degrees from Oxford, Cambridge or London universities. "Behind the announcement lies the Prime Minister's desire to increase dramatically the market for overseas students as a way of making money for UK universities. A target of 75,000 extra overseas students by 2005 in universities and further education colleges has been set. Overseas students currently bring in $1,120,000.00 USD in fees. It is hoped that the e-university will raise a similar amount." (Hodges, 2000) Most of the students studying in this way will be pursuing degrees in technologies; engineering and technology, business and administration, law, medicine, computing and economics.

Education has become a bigger and more complex business in the last ten years. Applying business principles and processes to manage the quality and improve the product is the right thing to do. Setting up the processes, having the clout to influence the loose confederation of "schools" in a university setting and making this a continuous process are most important to the success of CQI for Education.

## REFERENCES

- Boyle, Patrick and John A. Bowden, (1998). *Educational Quality Assurance in Universities: an enhanced model.*
- Boyle, Patrick, Views from Different Hilltops, (1997). "Getting the Indicators Right in Educational Quality Assurance", *Proceedings of TEND 97 Conference.*
- Hodges, Lucy, "UK launches e-university to sell degrees to world", *Web Document*, February 2000, http://www.independent.co.uk/news/Digital/Update/2000-02/edegree120200.shtml
- Imai, Masaaki, (1986). *Kaizen: the key to Japan's Competitive Success*, McGraw-Hill.
- Newby, Timothy, et.al., (1996). *Instructional Technology for Teaching and Learning*, Merril,.
- Palloff, Rena M. and Keith Pratt, (1999). *Building Learning Communities in Cyberspace: effective strategies for the online classroom*, Jossey Bass.
- Woodhouse, David, *Quality Assurance: international trends, preoccupations and features.*

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Crossroads of the New Millennium

# Quality Requirements And Requirements For Quality: Research, Education And Practice

Prepared and Presented

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Workshop 1

# Abstract

This paper discusses the notion of quality in terms of satisfaction of stakeholder requirements. The paper argues that the elicitation, specification, analysis, and communication of stakeholder requirements are key activities in determining the success of a system. The paper then argues that these activities, collectively known as *Requirements Engineering*, demand multi-disciplinary skills that should be part of the

# Quality Requirements and Requirements for Quality: Research, Education and Practice

## THE ROLE OF REQUIREMENTS

This paper argues that the degree of satisfaction of a system's requirements is the primary measure of that system's quality. This necessitates an identification of system stakeholders, an accurate elicitation of their goals, the specification of these goals in a measurable form, and a means for managing this process and the artifacts it generates. We use the term 'system' to cover both human-activity systems (e.g., business organisations) and technical systems (e.g., software or IT systems). Our focus in the paper is on heterogeneous, composite systems, that is, systems comprising multiple technologies and involving a wide range of stakeholders. The university education system, with its increasing reliance on technology as well as people, is a prime example of the kind of system with which we are concerned.

*Requirements Engineering (RE)* is a term given to the collection of activities that include the elicitation, specification, analysis, and communication of stakeholder goals and needs. Stakeholders denote the wide range of actors in this process, from customers and users to analysts and developers. The RE process also comprises many sub-activities that involve the identification of key stakeholders and their requirements, the negotiation of requirements to produce specifications that are implementable, and the management of requirements specifications and documents to facilitate their evolution as stakeholders needs change.

The development of software-based systems (which includes many IT systems that support education and training) is a process that relies heavily on RE activities. The literature is full of examples of systems that have failed because of inadequate understanding of requirements. These not only include systems that fail completely with catastrophic consequences [Leveson *et al.* 1996, Nuseibeh 1997, Finkelstein & Dowell 1996], but also include systems that are misused or used ineffectively by their users because they do not quite meet these users' needs. Moreover, the economic argument to support the need for RE is also strong: errors discovered late in the development life cycle are more expensive to fix than those discovered early [Boehm 1981].

The research and practitioner communities have recognised the importance of RE in systems development, and the last decade has seen an emergence of publications, research programmes and conferences devoted to advancing this field. Recently, the U.K. Department of Education

& Employment (DEE) funded the establishment of a series of "Centers of Excellence" in "High Technology and IT Training", including a *Center for Systems Requirements Engineering* at Imperial College, London. This center has been designed to investigate and deliver IT training to students in academia and industry, in an environment that facilitates group working and learning.

## MAKING REQUIREMENTS MEASURABLE: QUALITY REQUIREMENTS

Performing RE effectively is difficult. Typically, users find it difficult to articulate their requirements, and often express their needs in terms of existing systems and constraints. Similarly, technically minded developers often try to solve problems that they think their customers have, using technology to which they have best access[1].

The research community has recognised that this approach to systems development is inadequate. As software-based systems become increasingly large and complex, there is a need to understand the requirements for such systems and to relate these requirements to existing – and changing – business processes and systems architectures. The model of development as a sequential process is no longer realistic, and there is a need for organisations to adopt flexible and iterative processes to survive in volatile business environments. Only after such a perspective is taken, should technical considerations be considered.

Moreover, even from a technical perspective, achieving quality in IT systems requires explicit expression of functional and non-functional ("quality") requirements in a form that is measurable or testable. Without quantifying requirements in this way, any discussion of quality is not useful. It is not sufficient to ask for systems that are user-friendly, reliable, efficient, maintainable, etc. in order to verify that they have been achieved in the final delivered systems. These (quality) requirements must be quantified on some defined scale of measurement.

Of course, while the explicit expression of requirements is a pre-requisite to achieving quality, it is necessary but not sufficient. Other factors will also play an important role in achieving quality assurance. One such factor is the introduction of an Independent Validation and Verification (IV&V) strategy. Recall that Validation asks "are we building the right system?" whereas Verification asks "are we building the system right?" [Boehm 1981]. Answering such questions is an important step towards achieving systems' quality, and there is evidence that performing such validation and verification (V&V) independently is particularly effective [Arthur *et al.* 1999].

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[1] This sadly gives credence to the saying "when you have a hammer, everything looks like a nail"!

## AT THE CROSSROADS: REQUIREMENTS FOR QUALITY

With the increasingly widespread use and reliance on IT in many facets of our daily lives, there is a need for (a) better education of IT professionals to design and build systems that meet the requirements of industry and business; and (b) better training in IT skills for the population at large, to make optimal use of existing and new IT systems that are increasingly available.

We believe that RE education and training are critical for delivering quality systems. However, RE is also a multi-disciplinary activity, necessitating that professionals develop a wide range of skills and expertise that they would not normally obtain in a single degree programme they attend at a university or college. For example, RE draws upon knowledge and techniques developed in systems engineering, computer science, mathematics, philosophy and the social sciences. How does one develop an educational unit that delivers material in such diverse disciplines?

One thing is clear: the ubiquity of IT systems is such that users can be found in almost all walks of life. On the other hand, the complexity of modern IT systems is such that these systems also require increasingly knowledgeable and experienced developers to design and build them. It is unreasonable to expect that communication between users and professional engineers will always be possible. Rather, there appears to be a role for a professional *Requirements Engineer* – a sociable systems architect if you will – who can talk to customers and users, and talk to engineers, in their respective languages.

## REFERENCES

- B. W. Boehm, (1981). *Software Engineering Economics*, Prentice-Hall, 1981.
- A. Finkelstein and J. Dowell, (1996). "A Comedy of Errors: the London Ambulance Service case study", *Proceedings of 8th International Workshop on Software Specification & Design (IWSSD-8)*, pp.2-4, Germany, April 1996, IEEE Computer Society Press.
- N. Leveson, (1995). *Safeware: System Safety and Computers*, Addison Wesley Publishing Company, 1995.
- B. Nuseibeh, (1997). "Ariane 5: Who Dunnit?", *IEEE Software*, 14(3): 15-16, May 1997.
- J. D. Arthur, M.K. Groner, K. I. Hayhurst and C. M. Holloway, (1999). "Evaluating the Effectiveness of Independent Verification and Validation", *Computer*, 32(10):79-83, October31/01/00r 1999, IEEE Computer Society Press.

TEND 2000

Crossroads of the New Millennium

# Role Of AAST In Promoting Quality Higher Education For The Arab World And Obtaining ISO 9001 In Education

Prepared and Presented

By

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Monday 10 April, 2000

## Workshop 1

# Abstract

The Arab Academy for Science and Technology and Maritime Transport (AAST) is a specialised educational institution of the Arab League engaged in teaching, training, research work, and projects. The Academy is a multifaceted institution with a diversity of functions serving a multinational body of students coming mainly from Arab countries.

On September 4th 1999, the Academy was granted the ISO 9001 in higher education for the Bachelor Degree in Engineering, Management, and Maritime Transport; thus becoming the first higher education institution in the Middle East to obtain such a recognition of quality education. This significant milestone marks a ring in a chain of procedures throughout the Academy's strife for quality education since its inception in 1972.

This paper presents the way in which the Academy complies with the 17 Articles of the Paris Declarations of UNESCO issued on October 1998. Special emphasis is made in article 11 "Qualitative Evaluation" stating that "Quality in higher education is a multidimensional concept, which should embrace all its functions, and activities: teaching and academic programmes, research and scholarship, staffing, students, buildings, facilities, equipment, services to the community and the academic environment.

The ISO 9001 quality management process model for education is described in terms of management responsibility, resource management, process management, measurement and analysis improvement. This presentation will include the main building blocks of the quality system addressing quality plans, core processes, support processes, and codes of practice. Implementation steps will also be explained including documentation plans, building staff and faculty awareness, integrating quality procedures, internal audits and corrective actions.

# Role of AAST in Promoting Quality Higher Education for the Arab World and Obtaining ISO 9001 in Education

## TOMORROW'S TREND

To respond to the need and demand for worldwide higher education, internet based and other virtual means of educational delivery will become ubiquitous and in the process, completely transform the culture of education. The structure and process of higher education will change, thus Quality Assurance principles and processes appropriate for an international and cross cultural environment are a near term and real need issue in order to encourage educational quality in a time of profound transition.

This process of change will be both messy and painful - we can use quality standards as a way of controlling the mess and pain. Now is the time to hand out the key to higher education which nations of the world need and quality assurance can keep the revolution civilised.

## REASONS FOR ASSURING EDUCATIONAL QUALITY

- Healthier economy.
- Massification of education.
- Rise of private education.
- Professions moving across borders - we need to prepare people for the global economy
- Programmes matching labour needs.
- Doing more with fewer resources.

## GLOBALLY AGREED REQUIREMENTS

- Course and programme offerings explicitly and publicly disclose goals and objectives.
- Course and programme goals and objectives are derived from the institution's more broadly- stated mission and purposes.
- Course and programme goals and objectives identify and address educational needs understood by students who enroll.
- Information used to encourage student enrollment is truthful about the content, educational level and acceptance of courses and programmes in the educational community
- Admission requirements for courses and programmes are clear and publicly disclosed.

- There are sufficient academic staff for the teaching goals of the university to be achievable
- Staff resources are effectively and fairly developed; roles and relationships are well defined and understood; duties allocated are appropriate to qualifications, experience and aptitude; provision exists for review, consultation and redeployment.
- Courses and programmes have a coherent underlying philosophy.
- Proposed programmes are consistent with the institution's charter and mission and contribute to its objectives.
- Courses accurately reflect their declared objectives
- Teaching is well planned, with clear links between curriculum content and teaching methods.
- Teaching is effectively performed, using a variety of techniques and situations to take account of differences in backgrounds and learning styles
- The institution identifies both process and outcome indicators.
- Teaching is evaluated regularly, using a range of methods of evaluation, including student evaluation and peer evaluation.
- Teaching effectiveness is monitored in relation to stated objectives and learning outcomes.
- Frequent reports to students on their academic progress accumulated in a record of attainment
- Procedures to detect, at an early stage, a student in academic difficulty.

**WHAT IS ISO 9000?**

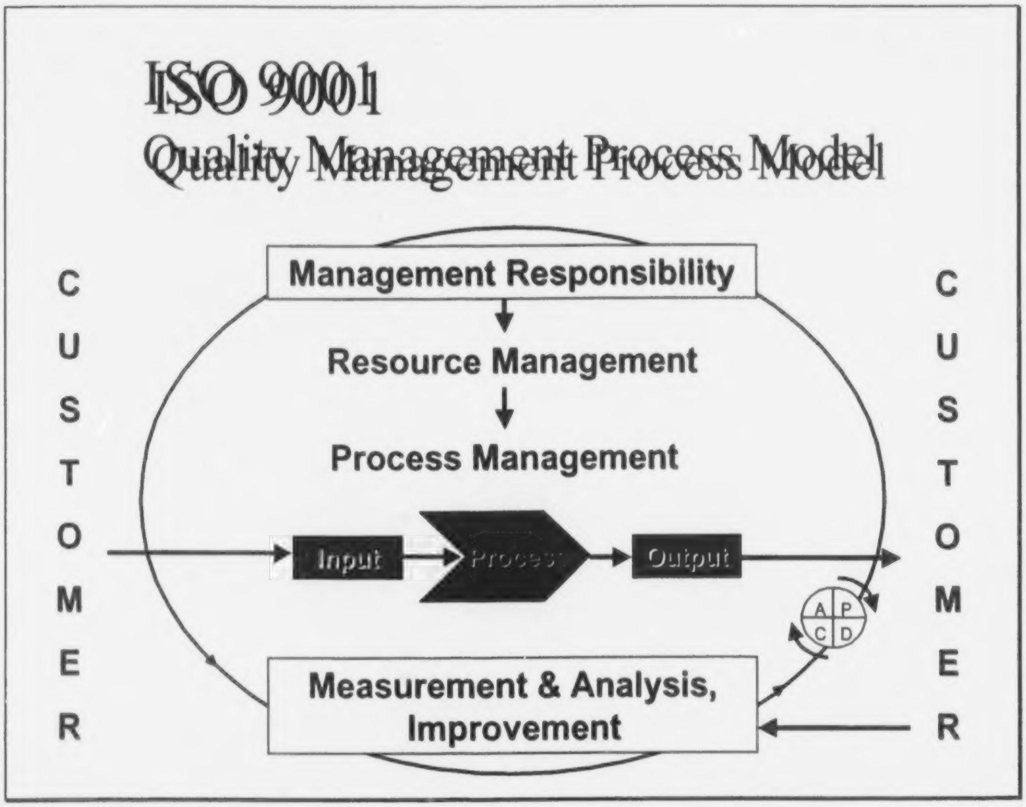
"Quality is never an accident. It is always the result of intelligent effort!"

ISO 9000:

- Applies international consensus on good management practice
- Is co-ordinated by the International Standards' Organisation
- Seeks to identify & meet customer requirements
- Seeks to achieve consistency in Methodology
- Creates a culture of continuous improvement
- Covers any organisation-education, health, commerce, manufacturing
- Defines Organisation and Responsibilities
- Reviews Customer Requirements
- Controls Design Activities
- Controls Documentation and Data

**BS EN ISO 9000**

- Purchasing Controls
- Process Controls
- Inspection and Testing (Verification)
- Calibration of Equipment
- Reporting of Non-Conformance
- Corrective and Preventive Action
- Records
- Internal Audit
- Training



ISO 9001

Quality Management Process Model

CUSTOMER
Management Responsibility
Resource Management
Process Management
Input
Process
Output
A P
C D
Measurement & Analysis, Improvement
CUSTOMER

**QMS SCOPE STATEMENT**

The development and delivery of programmes of study leading to Bachelor degrees include:

- College of Maritime Transport & Technology
- College of Engineering & Technology
- College of Management & Technology

## QMS ORGANISATION

- **President:**

  Responsible for articulating the Academy's overall strategy and monitoring and approving associated policies and plans.

- **Management Representative (MR):**

  responsible for ensuring that the Quality Management System is implemented effectively, throughout the Academy and for reporting on its effectiveness to senior management through the Management Review process. The Deputy for Executive Affairs is the nominated Management Representative.

- **Academy Quality Representative (AQR):**

  Responsible for co-ordinating the implementation and maintenance of the Quality Management System on behalf of the Management Representative and for liaising with the departmental Quality Representatives. The Dean of the Productivity and Quality Institute is the nominated AQR .

- **Quality Representative (QR):**

  The owner of each Quality Plan appoints a local Quality Representative who is responsible for the maintenance of the Quality System within the unit(s) covered by the plan.

## DOCUMENTATION STRUCTURE

- **Management System Manual:**

  This document contains the Academy's policy and objectives for quality. It defines the key responsibilities of those who manage the various functions within the Academy and gives a summary of the core business and supporting process, which enable it to meet its business objectives.

- **Quality Plans:**

  These documents contain further detail as to the organisation and services provided by units within the Academy (e.g.) ISO support.

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- **Work Instructions:**

  These documents describe the key processes within the Academy. They define responsibilities and methods of control and ensure compliance with ISO 9001. They fall into three categories: Core Business, Business Support documents which supplement Management Procedures, and are developed when there is a need to provide prescriptive detail in order to ensure consistency in the performance of a task.

- **Codes of Practice**

  These documents provide detailed information regarding the implementation and administration of key activities within the Academy. Codes of practice can be made available to students and members of staff. e.g. assessment of students

  Credit Hour System

  Student Discipline

## PROJECT PLAN

| | |
|---|---|
| Approve Project Plan | December 98 |
| Train Quality Representatives | December 98 |
| Develop Quality Plans | January - March 99 |
| Agree Procedures | January 99 |
| Develop Procedures | January - March 99 |
| Implement System | January-March 99 |
| Conduct Internal Audits | May - July 99 |
| Implement Corrective Actions | May - July 99 |
| Conduct Mock Assessment | June 99 |
| Management Status Meetings | Monthly |
| Management Review Meeting | June 99 |
| Third Party Assessment | July 99 |

## REFERENCES

- International Conference on "QA in Higher Education", Glasgow, UK, 22-28 March 1998.
- "Guidance Notes for Further Education and Training", Premier, UK.
- "Guidance Notes for the Application of BS 5750 to Education and Training" BSI, Quality Assurance, UK
- Systems, Procedures, and Regulations of 31 universities.

TEND 2000

Crossroads of the New Millennium

# Preparation For Life-Long Learning: Putting People Back Into The Centre Of Learning

Prepared and Presented

By

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Monday 10 April, 2000

Workshop 1

# Abstract

The notion of work - as paid employment - is being redefined through the reconfiguration of work and the workplace. One speaks of workplaces rather than the workplace today. Work of a contingent form is growing at a rapid rate. The corporate life of individuals is shrinking. The labor marketplace for employment is global. Knowledge - not information - is the currency of the future and is deemed to be among the few things that will differentiate individual and organisational excellence, innovation and potential. What strategies can education, as a discipline, and education as an institution offer people to embrace and prepare them for what the future may pose? This interactive workshop will explore the issues of the changing nature of work and how educational processes / cultures of practices and research may assist with putting people back into the centre of learning, beyond economic rationalist, managerialist and market driven notions of Neo-Capitalist forms economics.

# Preparation for Life –Long Learning: Putting People Back into the Centre of Learning

The facilitation of education in communities is shaped by political and economic imperatives. The communities I write of here are workplaces, schools, Technical and Further Education (TAFE) Institutes, Higher Educational facilities and private providers. Each of these micro-worlds is affected by 'systems' created at the macro level, systems that are shaped by interpretations of political and economic policy imperatives.

This paper and consequent workshop explores some of the frameworks, practices and concepts that give shape to our educative efforts. It is eclectic and draws upon, (among others), the fields of education, sociology and management/organisational theory to underpin assertions, and observations. The exploration commences with a framework to guide a brief discussion about political and economic discourses. This is followed by a brief outline of functionalism, providing a way into understanding some of the principles underpinning educational practice in Australia/globally - with its emphasis upon industry lead initiatives. The work of Matthews (1994), is used to illuminate the shifts currently underway in organisations. These frameworks and principles are subsumed into an account of Melbourne University's Faculty of Education where cultures of practice and research are being merged as a way of putting learners back into the centre of learning. Life-long learning (LLL) is juxtaposed with exemplifications of cultures of University practice and research, and assertions made about how these two cultures couple with LLL for mature age learners.

## CRITICAL/INTERPRETIVIST AND DETERMINISTIC/TECHNOCRATIC FRAMEWORKS

A helpful framework to summarise some of the shifts in organisational theory and practice provides some explanation as to why the shifts / current trajectories in educational/industrial learning. (Refer to attachment number 1 - Grint, K. (1993) Sociology of Work, Polity Press, Sydney Australia).

## POLITICAL AND ECONOMIC DISCOURSES

Discourses are shaped by many factors and forces, among them being politics and economics. I do not intend to include a detailed study of economics and politics. However, it is important to understand that economics and politics are powerful shapers of policy direction and content.

At the risk of offending economists with the brief array of comments that follow, it could be said that two major schools of economic thought shape political actions, policy creation and couple with political ideologies. The two schools of economic thought I refer to are broadly known as Keynesian and Classical / Neo –Classical economics.

Keynes, a significant figure in the field of economic research and the establishment of economics as a serious field of endeavour, proposed that governments may, at times, need to intervene in the workings of economies to ensure a realisation of effectiveness. These times may be during a period of economic malaise, when a nation's citizens may be suffering hardship, when industry requires a modicum of protection – for example during market establishment phases and through the use of tariffs. Keynes saw a need for governments to intervene in the workings of economies as a stabilising force, to moderate market forces that may adversely affect a nation's citizens, and consequently a nation's wealth.

Classical / Neo –Classical economists broadly hold the view that significant government intervention would artificially alter the market forces at play in economies and therefore perhaps prolong the effects of an economic adjustment. Their views highlight the importance of smaller governments and of less government intervention in economics – to ensure that market forces have a much greater prominence in the shaping of the workings of an economy. Market forces, they assert, settle things out and drive an economy in a more dynamic, healthier, 'natural' manner. For example, they do not support the use of tariffs for industry protection and the use of a high proportion of government revenue for citizen welfare payments.

There are no pure versions of Keynesian or Classical/Neo-Classical economic models used by Australia's two major political parties. However, it could be said that the present Australian Liberal Party is more Classical / Neo-Classical than the Australian Labour Party – which has a distinct Keynesian orientation in its economic modelling of policies. However, it could also be argued that there is a blurring of the boundaries between the two - hence some confusion for those who vote. These statements may help with understanding some of the differences in political and economic ideologies that underpin party politics so evident in the shaping of Australia's (current western societies) educational policies. These same statements help further support HOW governments couple policy initiatives to particular views of the world, economic and political ideologies. With these thoughts in mind I would like us to briefly explore the concepts of Economic Rationalism, Human Capital Theory and Managerialism….the current world views that are being used by economists and politicians to shape educational practice.

## ECONOMIC RATIONALISM (AT TIMES CALLED INSTRUMENTALISM)

Economic rationalism is often associated with the notions of efficiency, higher levels of productivity, a concern for competition and less government intervention. The view is that society can be made to proceed according to a formula (Oakeshott, 1991). The word rational implies a sense of logic of scientific, instrumental accuracy. Pusey (1991), characterises economic rationalism in the following manner:

- Welfare spending is too great
- Higher levels of unemployment are acceptable
- Public Sectors should be deregulated
- Wages and salaries are too high
- National income should be re-distributed from wage earners to the wealthy
- Public spending should be cut - (included in this is spending on education)
- The burden of taxation should be moved from business inputs to consumption goods

The rationality behind such statements is that business needs freedom to stimulate economies to create national wealth and employment. The rationality supports the Classical / Neo-Classical model of economics associated with smaller government, less regulation and the use of market forces to shape economic endeavours. Market forces shape consumption via the user having to pay ' market rates' for services/goods. The focus is upon the efficient delivery of those goods and services not the social value or social consequences of delivering the goods/services at 'market rates'. The determination of 'market rates'? – whatever the market will bear. By this I mean, if the price is too great for a given majority of people, people will not purchase the services/goods. The market determines what price and how many goods /services are exchanged. The instrumental notion is associated with the 'rational' array of actions that may occur to deliver a particular set of outcomes desired by governments. The desired ends (balancing the budget?) and the means (selling off government utilities?) are calculated in a 'rational' fashion. The difficulty is, what may seem 'rational' to some may seem totally 'irrational' to others! The emphasis of instrumentalism is upon the technical merits of the rationality not the social consequences.

Economic rationalism is perceived to be a viable instrument for policy design in times of:

- High levels of unemployment
- Low economic activity
- Questions raised about the quality, outcomes and direction of education and;
- A change in government policy direction is warranted.

The major shift is from a supply form of government to a market driven , demand driven application of economics and politics.

The shaping of educational policies began to be influenced by this concept in 1988 by John Dawkins Federal Australian Labour Party. In his document entitled 'Strengthening Australian Schools' we begin to see the emergence of another phenomenon – Neo-Corporatism / Federal Corporatism.

## NEO-CORPORATISM/FEDERAL CORPORATISM

Broadly speaking, Neo-Corporatism may be defined as Co-operative arrangements between industry, governments, and staff associations/unions with the formulation of policy initiatives and policy directions. (An Australian example) -The Finn review, (a review of Post-Compulsory education in Australia) was undertaken by a committee consisting of two representatives from the Vocational Education and Training (VET) sector, a representative from business, another from the trade union movement, a Commonwealth nominee, two State and territory education representatives, and the Chair, Brian Finn, being selected by the then Australian Education Council committee. The intent was/is to ensure that decisions made about educational policy are in the Nation's interest and support Federal and State government relations. This intent is further enhanced by a desire by Federal governments to restructure processes (in this instance education) – to again serve the nation's interest. This we could label Federal Corporatism. However, these notions are shaped by the concepts and discourses associated with the concepts of Economic Rationalism, Managerialism and a version of Human Capital Theory (Lingard, 1991).

## MANAGERIALISM

Relationships of power and control in an organisation are shaped by the views, styles and processes used by management (management not leadership) in order to realise results. Managerialism is focused upon results, which are of far greater importance than the means of 'getting the results'. Efficiency is paramount as is output of organisational efforts.

Two key attributes one could ascribe to managerialism are:

1. Private sector practices may equally be applied to public service sectors of an economy and,
2. any problem can be resolved through efficient management practices

Managerialism has become an important means for State and Federal governments to realise greater efficiencies in the public service sector. Education and Training policies have become a major force that have aligned themselves with a number of Federal and State government's economic rationalist and social imperatives (OTFE 1998). Many of these policies have been implemented in a host of VET settings in a managerialist manner. Further to this, most VET initiatives are being implemented in a Neo-Corporatist Managerialist manner. By this I mean the Federal government is encouraging the interpretation/implementation, and creation of VET policy initiatives through establishing decentralised groups consisting of industry, government, and other interested parties. The role of 'industry' is to be the 'main driver' of policy initiatives.

## HUMAN CAPITAL THEORY

A major premise of Human Capital Theory is: "...each person as having a stock of human capital...the acquired skills, knowledge and experience which enable them to perform more less effectively in the workplace...education and training are seen as building an individual's stock of human capital..." (OTFE, 1998 p. 1).

The focus for education – especially vocational education – is the preparation of people for work (occupational paid employment). The major activities for educational practitioners should centre on the acquisition of skills, knowledge and appropriate traits that prepare people to become productive workers. (Competence or capability?) This is one assumption. A second consideration? ... That learners experience few hurdles in accessing education and training. Another is that education is about preparing people for work and not life. Finally, that vocation is the same as job or occupation. The word 'vocation' is being applied in a very narrow fashion here. Vocation should perhaps be related to one's chosen direction in life – part of which is an occupation or a number of occupations over one's life. The word vocation is not the same as occupation. However, it is being used as such in many instances that align themselves with a newer (Neo-Capitalist) interpretation of Human Capital Theory. Many policy initiatives associated with VET are perhaps not 'vocational' in orientation they are 'occupationally' specific. Are Australian 'Training Packages' an example of vocational education or should they be labelled a form of 'occupationalism'?

Human Capital Theory also asserts that a nation's wealth is realised through individual growth via education, training and the continual acquisition of skills / attributes. The acquisition of these 'tools' enables people to 'sell' their labour to others who need it. This in turn means people acquire a level of social mobility. To explain a little further, by people adding to their level of human capital they may move socio-economically speaking or they may move across geographic boundaries (an issue of growing importance in a potentially global labour market place). This affords people a modicum of control over their lives – their chosen direction in life – their vocation. This idea is summarised well by the comments made by Cohn and Geske, 1990, p.34 "...human capital approach makes an individual more valuable...more mobile...a highly capable worker will have a wider spectrum of potential employment opportunities..." and another view...

"...education is a human enterprise that cannot be brought under any economic laws of supply and demand and cannot be conducted on business principles...".West, R The Age, p. 3. May 28th, 1998.

## FUNCTIONALISM

Most current vocational educational trajectories, underpinned by the present interpretation and application of economic rationalism, managerialism and human capital theory frameworks, couple with a sociological concept known as functionalism...(systems theory - metaphor: organisational as a machine).

The importance of systems theory, systems thinking and systematic approaches to training, development and evaluation strategies have reached new heights in the circles of education. This is particularly so because of the importance placed upon the role of industry / business and their shaping the directions / practices of education, and research. A considerable amount of learning theory, psychological constructs and curriculum theory that underpins the training and development of adults, (and now youth in Australian schools - as another example), is underpinned by systems theory and systems thinking. Competency training practices also premised upon the acceptance of systems theory as 'the valid' approach to learning facilitation.

Having made these claims you may begin to see a connection between Structural Functionalism and public VET policy initiatives. But what are some of the views held by

Functionalists? Functionalists, as the name indicates, aspire to order and harmony in society – realised through each element of society having a place, each complementing and fitting with each other part. The metaphor of a machine may help further illustrate what I mean. Imagine a machine made up of chips, wires diodes and capacitors. Each component has a role to perform; each fits with the other to enable the total machine to work in harmony. If you remove one or two chips from the machine the total machine ceases to operate. It is dysfunctional and disharmony would prevail.

Functionalists view society much like a machine. For example each service, function and human must find a suitable place within society for society to realise a state of harmony and function properly. All of these components, and others that you may be able to list, must be integrated. For harmony to exist there also has to be a level of consensus.

Functionalists assert that education, regardless of its level or domain, is considered to be an important factor in the shaping and facilitation of harmony and consensus in society. Educational policy is perceived to be, from a Functionalist perspective, a major means of realising a culture that is desired by society, a culture that is considered to consist of shared values, norms and conventions. Educational policies design by a Functionalist need to complement and interrelate with a host of other factors, institutional and social wants that may be present in society at a given time in history. Without such consideration society, as a place of harmony and consensus, would be dysfunctional.

Functionalists would also assert that education provides for:

- greater equality – all should have access to the same kind of 'education'
- expansion of educational opportunities of all kinds in all sectors / contexts
- an opportunity for a response to change due to technological innovation
- an increase in the levels of intellectual / skill acquisition of a society
- preparation of youth for employment
- greater economic growth opportunities for society
- preparation for job recruitment and preparation

Reading through the list cited on the previous page it is apparent that current policy initiatives, advocated by contemporary educationalists, are clearly Functionalist in orientation and purpose. The assertions are limited because education is but one component of activity that shapes society. From a Functionalist perspective it would be quite simple to make statements about the failure of education not performing its societal roles appropriately.

The following examples may shed some light on this:

- Unemployment is a dysfunctional element of society – is this due to the failure of educational process and orientation to task alone?
- Does education provide equity in society through the communication of common values and norms – or do some people experience different types of education in their preparation for living in society? Consider differences in vocational educational preparation and experience between a mechanic and a dentist.
- Have Functionalists ignored differences between socio-economic, gender and racial groups in society?
- does educational process and orientation to tasks promote a dominant group view of what society's values, norms and consensus are – where does equity feature in this equation?

The claims made by Structural Functionalists are perhaps utopian. However, you may consider some be worthy ideals to strive for. Suffice to conclude this overview with the statement that contemporary education is shaped by Functionalist policy views of the world. The political and economic realities demonstrate that Functionalist policy perspectives may reproduce social norms, social division and are not congruent with educational practice or ideals. Mann asserted that Functionalism could realise utopia:

"...education creates social mobility, prevents class warfare, encourages economic growth, protects popular government by creating informed citizens, (socially engineered citizens? – my italics), stops crime and disorder by inculcating moral values and promotes health through physical education..." (Mann, H. (1848). Report to the State Board of Education, Boston, USA).

Productivity/Efficiency: Shifts From Mass Production To Lean Production And Sociotechnical Production Systems

Matthews (1994) extract, (Refer to attachment number 2), provides a helpful framework to guide our thinking / searching for an explanation as to why our social world is rapidly changing. An exploration of his assertions and the possible effects upon educational process and our learners' needs should be surfaced at this stage of our workshop activities.

## MERGING THE CULTURES OF PRACTICE AND RESEARCH - A HIGHER EDUCATION PERSPECTIVE OF MATURE AGE LIFE-LONG LEARNERS

A culture of practice could be spoken of in terms of education and training for work. If we accept 'work' to mean paid employment (Grint, 1993), and 'education' meaning skills, knowledge, attributes and more recently capabilities ( Sredl and Rothwell 1992, Jin, D.J., and Stough, R.R. 1998) then, for example, the University of Melbourne has been shaped by and responded to a culture of practice for over a century. For instance within schools of medicine and law a student acquires medical and legal skills, medical and legal knowledge and attributes that befit a person to take up the practice of medicine and law post graduation. Capabilities in these disciplines are called upon post graduation, as students enter into the practice of medicine and law in the wider community. The notion of capability infers higher order thinking and learning that encompasses analysis and synthesis in a world of changing expectations and contexts. To maintain currency students of medicine and law are required to engage in a life and love of learning; their culture of practice requires life-long learning[1] to be embraced as a means of maintaining capability. However, in this account of mature age learners it seems a reversal in sequence of knowledge acquisition / acknowledgment is occurring. Universities are being asked to credential and acknowledge the merits of mature age students who arrive at their campuses with an already established culture of practice and limited conceptual development. Simultaneously, in practice, these same mature age students are asked to suspend, to a degree, the worth of their established culture of practice and enter into a new, (for them), culture of higher degree research.

## THE METAPHOR OF A JOURNEY

The journey for a Department of Adult and Vocational Education commenced in 1995 when it became amalgamated with the University of Melbourne. On January the 1st, 1997 the Department was merged fully into the Faculty of Education, a Chair in Vocational Education and Training was established and the Department's name changed to reflect the title of the inaugural Chair - Department of Vocational Education and Training (DVET). This part of the journey ended on the 31st of December 1999. The Department was subsumed into a research centre and located within another Department[2] within the Faculty of Education.

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[1] Life long learning denotes a form of learning that enhances one's vocational capabilities regardless of what vocational pursuits one engages upon.

[2] The new Department the CHRD and T is located within is titled: Educational Policy and Management.

(The Centre's title is: Centre for Human Resource Development and Training - CHRD and T). This portion of the journey illustrates how one culture of practice maybe replaced by another. It also demonstrates the final supplanting of a culture of practice with a culture of research.

Rapid shifts in culture are quite common in the post-Fordist world of work. With the infusion of changing workplace practices, deemed necessary to keep pace with higher levels of competition, the maintenance of difference between an educational market-place that seemingly offers the same to all students; the University of Melbourne decided to aligned itself with research rather than teaching endeavour. Those who were already well placed in the University's culture of research did not escape some of shifts in thinking and their perception of a 'traditional' University culture. The acquisition of intrepreneurial and entrepreneurial skills challenges the thinking and culture of work practices for research based academic personnel.

This brief description of a journey currently under way by newer and established University academic personnel parallels the expectations made of mature age students who enter a University Faculty for the first time, commencing a journey that may result in undertaking a higher research based degree.. Mature age students, as beginning researchers, have little or no understanding of research. They do have a sound appreciation of intrepreneurial and entrepreneurial skills and knowledge. They do have a range of capabilities, pertinent to their particular chosen vocation. They have already commenced their life-long learning journey and arrive at a University campus with the expectation of continuing and deepening that journey, or perhaps taking another direction altogether. The mature age student and the University need to some how explore ways and respect the complimentary differences in forms of learning acquisition and expectation placed upon each as they commence this journey. How might a research based University acknowledge learning in other contexts, beyond the walls of faculty facilitated learning? How might a beginning researcher learn to embrace the rigours and challenges of research that, at times, might seem like an array of esoteric pursuits that have little or no use? I suspect the answer lies in mutual respect and education about what constitutes knowledge and learning - for the University - and what constitutes research - for the beginning researcher. What follows is an exploration of these questions and constructs. Examples will be used to illustrate the current understanding and practices by the Melbourne Faculty of Education. This exploration leads to the creation of a framework to model a 'culture of research practice' for beginning mature age researchers. It is here that I suggest a culture of practice and a culture of research merge, much the same way as Departments within University Faculties.

## LIFE LONG LEARNING - A CULTURE OF LEARNING PRACTICE?

Life long learning (LLL) is perceived by the European community of scholars as a positive means of solving problems such as unemployment, re-skilling the workforce, embracing strategies that enable people to cope with rapidity of change. The acquisition of work-related knowledge is important for all that work in paid employment. In many instances it is simply not a matter of accessing a range of work related experiences, opportunities to practice, and learning new skills and acquire new knowledge. For example, it has been shown that many uneducated mature age workers have been labelled as beings that have a diminished capacity to learn. They lack a capacity to learn because they have had limited educational experience and have not acquired the skills of learning. Their employers perceive them as bad investments. By this I mean uneducated mature age workers will have little employer investment expended upon them to re-train and/or expose them to new experiences because they lack the capacity to keep pace with the rate of learning expected - they lack the capacity to learn efficiently. This does not mean mature age uneducated workers cannot learn. The assertion is that they require exposure to particular learning strategies to enable them to learn whilst simultaneously teaching them how to learn (Eliasson, G. 1997).

LLL as a strategy that enables people to acquire skill and knowledge is not new, what is new about the application of LLL in the latter part of the twentieth century and beyond, is the notion that in order for people to ~~retain their current employment~~ you have to acquire/replenish ever increasing levels of knowledge and skill. If there is a modicum of truth associated with this premise then people need to learn how to learn efficiently. The new instruments and 'tools' of work require people to be technologically and knowledgeably literate, and to keep pace with the plethora of knowledge (not just mere information) that underpins such expectations. Employees are becoming knowledge-based workers[3]. These workers are not merely competent they are capable. Capable employees use higher order thinking skills, can synthesise and assess a host of variables in a given context to solve problems that enable solutions for work to progress. These are not expectations required only from University graduates these are the expectations required of people working in trades, para-professionals such as Ambulance Officers and emerging professions such as information technologists.

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[3] A greater proportion of Australian (and other 'developed' OECD nations) workers are employed in information/knowledge based industries than ever before. However, the proportion of people required to work in these newer industries to enable viability and economic prosperity is quite low (UNSW Department for the Study of Industrial / Employee Relations - 1999).

## CAPABILITY?

Capability is perhaps the link between knowledge-based research and LLL. There is considerable debate about the value/worth of competency as a means of facilitating a culture of practice let alone the development of competent researchers. Capability may provide one answer to some of the issues and practices associated with the preparation of capable knowledge based works. Capable people are ones, who are independent, possess characteristics of skill, knowledge, value and esteem - LLL asserts the ~~control~~ of one's learning (Stephenson, J and Weil, S. 1992). Capability as a concept and as a 'tool' that gives shape to educational practice juxtaposes well with the four fundamental pillars of education asserted for the twenty-first century posed in the Delors report sighted in the papers from UNESCO, 1999:

> 'The future of education…should be built around four
> fundamental pillars * learning to know, *learning to do,
> *learning to live together and * learning to be…'
> (p.54 UNESCO, 1999).

## LIFE LONG LEARNING - A CULTURE OF LEARNING VIA RESEARCH?

It is imperative for any person about to commence research they understand from the outset that research is about making a contribution to knowledge. For anyone to make a contribution to knowledge they must have a sound appreciation of how to learn. The techniques of learning provide a modicum of 'capability'. People, who learn how to learn, are capable of accessing, discerning, critiquing, analysing and synthesising information. A person who is capable of performing these basic feats of learning is capable of undertaking research. They are capable of performing research because they possess skill in crafting information into knowledge.

A person requires a degree of independence if they are to perform research and learn from that performance. Research requires independent thought guided by action and those that have researched in a similar field of endeavour before us. The study of prior research, (accessing, discerning, critiquing and synthesising information and / or prior knowledge), provides a basis for inspiration and the demonstrated skill associated with controlling one's own learning, learning direction and eventual contribution to knowledge. It seems, on this basis at least, that any person who possess knowledge worker capabilities and can perform the basic feats of learning might learn how to perform knowledge research. Two brief case studies to help illuminate this assertion:

## CASE STUDY ONE - THE CARPENTER WITH A MASTERS DEGREE

After fifteen years working as a carpenter / builder Peter decided to become a TAFE teacher. Peter left school at year 10 to complete an apprenticeship. Peter had acquired a range of skills but he had not acquired the skill of learning to learn. He required new skills that would enable him to teach his carpentry skills. Peter studied and completed a Diploma of Teaching. Whilst undertaking this two year part time study programme Peter acquired the skills of learning to learn and how to impart these skills onto others. Peter had obtained something that acted as a catalyst for LLL. Peter required particular skills in administration and management of his educational endeavours. He obtained a place at University to study Educational Administration at Graduate level. Peter graduated three years later. Peter now required research skills at the applied and conceptual levels for him to make a contribution to knowledge - knowledge of how people may control their own learning (as well as Peter's) about rapid changes in the carpentry/building micro world of technology. Peter completed a Masters Degree in Education.

Peter's case illustrates a shift from a culture of practice to a culture that merges practice and research. Peter is now a knowledge worker in the carpentry/building world of technology. Peter has not lost his craft skills - he still builds and crafts in wood. However, Peter has much greater control over his life and learning because he has the skills that enable him to perform feats that tax his level of educational synthesis. He is capable of undertaking further learning about change -efficiently and effectively.

## CASE STUDY TWO - THE PLUMBER WITH A PHD

Stephen commenced his working career as a licensed plumber. He left technical school at year 11. Like Peter, after around 12 years working as a plumber he decided that he would like to teach others the skills of plumbing and gas fitting. He too obtained a place at a Teacher's College and completed a Diploma of Technical Teaching. Stephen taught in TAFE colleges for some years and developed an interest in understanding social issues and why it was that some people did not realise their full potential. Stephen was successful in gaining mature age entrance into University to undertake an undergraduate Degree in Sociology - whilst teaching full time Stephen took out a Degree in Sociology. Stephen undertook Graduate level studies and commenced a Masters Degree. His Masters Degree was accepted as being worthy of research at the level of PhD. Stephen completed his PhD research over two and a half years whilst lecturing and working full time at a University. Stephen retired at the level of Associate Professor after publishing and writing internationally for four years.

Stephen's case illustrates similar desires and capabilities to Peter. Stephen shifted discipline directions and undertook a study of the concepts that underpin sociology in order for him to contribute to specific sociological knowledge issues/questions. Stephen became a knowledge worker too. Stephen worked across a variety of boundaries - sociology, TAFE teaching, craft/trade workers in general and with University research students at the level of Masters and PhD. Stephen was able to conceptualise relationships between all these pursuits because of perceived similarities in the requirements for developing capability in LLL.

Examining the two case studies reveals some clues as to how mature age beginning researchers might learn about the rigours of performing research. In each study the student completed a course in teacher education. It was during this course of study that each student was introduced to strategies that assist with learning / helping others to learn. Each case study reveals that Peter and Stephen did not complete their secondary education. Peter and Stephen left school to undertake an apprenticeship; they were inducted into a culture of practice. Peter and Stephen learnt by doing and became accomplished artisans. Their accomplishments were accounted for when they entered Teacher's College. Their accomplishments were used to extend and build self-esteem and stretch their capabilities. What is not explicit in the two case studies is the work and design of the curriculum strategies encountered at Teacher's College that accounted for the particular cohort's present capacity to learn. It was understood that this would be limited, that considerable work would have to be completed by the Peter and Stephens of this world to acquire skills in learning prior to helping others in the same situation, learn. I suggest that Universities are not fully cognisant of this and perhaps explains, among many other reasons, why the retention rate for so many mature age University students and beginning researchers is still very low (Cameron, H. 1999). The same frameworks and practices regarding understanding, support and collegiate research activity need to be put in place for Universities to realise a greater degree/research completion rate and help people from all disciplines and traditions to make the transition from the culture of practice to the culture of research - learning about and contributing knowledge. The latter is becoming the basis for all occupational pursuits in the emerging global knowledge society.

## THE MELBOURNE UNIVERSITY FACULTY OF EDUCATION'S ALIGNMENT WITH THE SHIFTING TRAJECTORIES OF UNIVERSITY EDUCATION, TRAINING, TEACHING AND RESEARCH

In the latter part of the 1990's Professor Alan Gilbert, Vice Chancellor, launched the Melbourne Agenda and a strategic plan to enable all University Faculties to measure their achievements in relation to this expectation. This was a response to shifts in the way in which people may wish to engage with learning, the recognition of the notion - 'A Knowledge Based Society' and the Melbourne University wanting to situate itself clearly at the forefront of these changing trajectories. The Education Faculty Board endorsed a document entitled 'Future Directions of the Faculty of Education' on July 14th, 1999. This document details essential aims and performance measures to attest to the Faculty's adherence and endorsement of the Vice Chancellor's edict. Ostensibly, Melbourne is endeavouring to be Australia's pre-eminent, research; campus based University that embraces flexibly ways of learning. It perceives itself to be situated among the world's best Universities and has forged formal alliances with well known Universities in Europe, USA and Asia. The University also recognises that learning does not cease post graduation and may occur in many contexts, beyond the walls and grounds of the University. One can conclude from examining these statements that the University is endorsing LLL and knowledge based research. Coupling these two notions together publicly acclaims the necessity of continuous learning throughout one's life. The planned Melbourne University Private will complement possible learning through research by offering specialised programmes of study for a variety of professional/industrial pursuits. What follows is a brief examination of the 'Future Directions' document. Examining is helpful because it illustrates how a Faculty models congruency between these expressions of intent, and its own field of interest and endeavour. The words used to characterise the 'Future' are most interesting because they again illuminate a merging of LLL - learning acquired from a culture of practice and the culture of research. The expressions are also quite Functionalist.

> The emergence of a knowledge society is stimulating radical re-conceptualisation of education and training. Success in this endeavour is crucial for a strong economy, a civil society and the well being of every citizen (Faculty Board,

1999, p. 13).

The 're-conceptualisation of education' and the inclusion of the word 'training' are indicative of dramatic shifts in the thinking and practice of a Faculty of Education. Education has been broadened to include[4] the learning experiences of people beyond school and University. The inclusion of the word 'training' as a means of acquiring knowledge and skill acknowledges a culture of practice, one that underpins LLL. Education is also taken here to mean conceptual development, the acquisition of knowledge and skill, together with learning how to learn / how to draw from, acquire and contribute to a body of knowledge. The latter akin to a culture of research.

Whilst the Faculty of Education conceives this shift to be 'radical' for many current and former Teacher's College personnel this is simply a return to and an endorsement of a practice that was well understood and acknowledged formally - the culture of practice.

> Life-long and work based learning are extending both the scope and the role of educational providers (Faculty Board, 1999, p. 13).

The University recognises that the breadth of the former understood and practiced roles of educational providers needs to be inclusive and not exclusive. By this I mean those who are facilitating learning at a University level have to somehow countenance formal appreciation of multiple learning contexts, multiple modalities of learning and continuous LLL learning. For the mature age student this requires grappling with conceptual learning and exposition. To merge the two cultures of practice and research the mature age student needs to acquire skills and knowledge of multiple modalities of learning through learning how to learn. The quotation sighted above attests to the Education Faculty being shaped by formally recognising such phenomena as 'Life-long and work based learning'. On page two I illustrated how the University had been shaped by a culture of practice for over a century, that vocational learning in situ was very much a part of a right of passage into a profession such as medicine. However, the greatest emphasis, the highest level of recognition and credibility arose from the right of access to exclusive, for example, medical knowledge - not medical practice. In most cases medical graduates become medical practitioners. For some this would have challenged them considerably to, without assistance, adapt from a former culture of knowledge and research to one of practice. These experiences and expectations of medical practitioners, and the community who receive the services administered, are among the rationales for changing the learning experienced by medical practitioners in a number of Universities.

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[4] The use of the word 'include' means to formally recognise learning acquired in 'other' contexts such as TAFE colleges and the workplace. Formal recognition enacted through a process of Recognition of Prior Learning (RPL).

In an attempt to embrace a culture of practice and not lessen the importance of analysing and using knowledge based research, a number of Universities are using a strategy known as problem based learning (PBL). [5] Whilst not THE answer to embracing/merging the two cultures under discussion, as strategy it has the potential of helping people learn how to learn and provides a 'tool' to support LLL, and continuous research / potential contribution to discipline based knowledge. The Faculties of Medicine, Law, Engineering and now Education are using PBL to help people ~~learn and practice~~ an understanding of 'Life-Long and work-based learning' which requires educational providers to change and 'extend...the scope and role of educational…' provision. In many instances, and for the first time, the University has to place a greater emphasis upon teaching and learning. The Melbourne University has weighted teaching and learning as important as research when assessing its own academic staff and their contribution to the world community of scholars. For the mature age student there are opportunities to surface their culture of practice as a means of moderating and shaping their use and access to discipline based knowledge / research. The Faculty of Education is reassessing its core function of preparing and certifying teachers for early, primary and secondary educational contexts. The boundaries between these learning contexts and those of the wider world of work, the home, the University and virtual sights are blurring. These insights are encapsulated by the final two quotations I wish to use in this brief examination:

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[5] Problem based learning (PBL) requires students to learn how to learn through exposing students to discipline-related problems that require collaborative researching, expose, critique and synthesis. The problems created are derived from those typically found when practicing any studied discipline. The responses are used as a catalyst for furthering and deepening learning. It is during these phases of furthering and deepening learning that questions - requiring further research and knowledge exploration - arise.

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While teacher education will continue as a core function of the Faculty…complemented by new initiatives…creation of new options related to life-long and workplace education and training in diverse contexts but that re-assessment of traditional approaches and settings for learning and teaching is required (Faculty Board, 1999, p. 13)

The 'new initiatives…new options' refer to such practices as mature age learners (albeit possibly all future University wide learners) moving through a range of learning contexts accessing discipline based knowledge where required, complementing this with formally recognised workplace based knowledge, performing research when faced with problems or issues that require a response and as a consequence, contributing to widening the boundaries of knowledge, possibly in a cross knowledge based discipline manner. Therefore, 're-assessment of traditional approaches and settings for learning and teaching is required'. Two examples are outlined to illustrate how an Education Faculty is creating new options and re-assessing traditional approaches to teaching and learning, to help bring meaning to these statements:

## MASTER OF EDUCATION MANAGEMENT

The Faculty of Education created a programme entitled Master of Educational Management[6]. The new programme modelled itself upon a modified version of the MBA. A PBL strategy was selected as the means of facilitating the capabilities required of people who were to manage educational pursuits. The participants were briefed and set workplace-related issues to analyse, extricate, conceptually support and provide a detailed written report for their peers to critique. The critique also became a means for identifying gaps in conceptual understanding and a process to direct further learning. The expert input (achieved via teaching) and moderation (achieved through lecturing) came from the lecturer/teacher coordinating the unit of study. Boundaries between knowledge based disciplines such as economics and finance, human resource management, evaluation and management were blurred as the participants grappled with concepts, drawn from these study areas, to merge the cultures of knowledge/research and practice. The emphasis for learning was not upon the provision of 'correct answers' to assignment questions posed - as with 'traditional' approaches to teaching/learning. Participants learnt through collaboration, accessing knowledge/research to further their own learning, modelled practice that culminated in written applied research responses. The unit coordinator modelled how to learn with the participants, provided expert input when required - thus collaborated in the learning not merely presenting key concepts and frameworks to a selected cohort.

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[6] 1999 was the third year the Master of Educational Management has been offered by the University of Melbourne. The participants came from a variety of educational management settings - C.A.E, D.O.E, C.E.O, International Educational Administrators and Regional Directors of Education.

## BACHELOR OF VOCATIONAL EDUCATION AND TRAINING

The Faculty has offered the revised Bachelor of Vocational Education and Training (BVET) for approximately three years. This undergraduate degree is a response to an expressed need for a programme of study for training and vocational educators. The Bachelor's degree subsumes formal workplace learning and qualifications into the three-year course of study. The first year of the revised BVET acknowledges 'options related to life-long and workplace education and training in diverse contexts' through the provision of advanced standing for those who have completed training assessor and certificate level IV in training and development.

## TOWARDS AN INCLUSIVE MODEL OF PRACTICE AND RESEARCH WITHIN A FACULTY OF EDUCATION

The characteristics of mature age LLL students within the Faculty of Education were outlined in the initial parts of this paper. Capability is perceived to be a crucial element in forging links between what can be expected from those engaged in shifting between the cultures of practice and research. Among the catalysts acting upon the Melbourne Faculty of Education have been the recognition of an emerging knowledge based society and the search for ways of addressing rapid changes in knowledge, information flows, the blurring of boundaries between knowledge based disciplines, and the wider world requiring people to practice with insight. Insight and keeping abreast of change requires accessing and continuously contributing to knowledge. Even if a practitioner is not contributing to disciplined based knowledge through academic forms of research endeavour all (in a knowledge-based society) will need to have the means of understanding, interpreting and applying research to their culture of practice.

For the carpenter to undertake a higher degree at master's level and for the plumber to achieve a PhD required a considerable effort in understanding how to learn. For a University to bridge the links between the cultures of practice and research it first needs to formally acknowledge the importance of practice, application of knowledge and the teaching of practitioners how to learn. The journey to reconcile these differences and acknowledge the important contributions each has to offer a future knowledge based worker has only just commenced. The brief case accounts/examples of how a Faculty of Education is modelling some of these characteristics and practices illustrates how it is possible for University personnel and mature age LLL to countenance an appreciation of cultures of practice and research.

A word of caution. Universities need to acknowledge the importance of good teaching and use a variety of teaching modalities/styles to ensure the participants engage with their learning, and are modelled processes/practices that help them to learn how to learn. Conversely, for the mature age LLL they need to understand the importance of conceptual frameworks and principles of research. Realising such understanding can provide the 'tools' necessary for them to be capable knowledge based workers.

Working, learning and innovating…are all activities based on knowledge.conversion, in the sense of a continuous circulation and use of the knowledge that the organisation possesses and of the creation of 'new knowledge' in response to innovative needs. Explicit knowledge and tacit knowledge mutually synergise in the work context to achieve a dynamic balance between **know-what** (the theoretical level) and **know-how** (the practical level) without one or the other being dominant (Tomassini, 1997, pp. 5-6).

In the final UNESCO report (Refer to attachment number 3) compiled by Wiltshire in Seoul he remarks that the "…21st century will be an era of knowledge, information and civilisation…". On page seven (7) of the same oral report he speaks of windmills that will be blown via the winds of change and details ' sources of energy' that will move education forward; among these are:

- Political commitment
- Leadership
- Continuous life-long learning
- Teachers as mentors
- Curriculum reform

If we were to audit our progress and take these factors into account what is the status of our educational system/s and institutions?

## REFERENCES

- Cameron, H., (1999). "University Access and First Year Performance" OR "There is More To A Good Party Than Sending Out The Invitations" in *Australian and New Zealand Journal of Vocational Education Research*, Vol.7, No.2, 1999, AVETRA, NSW, Australia.
- Cohn, E. and Geske, T., (1993). *The Economics of Education* (3rd Edition), Potts Point, NSW, Pergamon Press.
- Eliasson, G., (1997). *The Case of Life Long Learning in Vocational Training* - CEDEFOP, No. 8/9, December, Germany.
- Faculty Board of Education, (1999). *Future Directions of The Faculty of Education*, Melbourne University, Parkville, Victoria.
- Grint, K., (1993). *The Sociology of Work, Polity Press*, Sydney, Australia.
- Jin, D.J., and Stough, R.R., (1998). *Learning and Learning Capability in the Fordist and Post-Fordist Age: an integrative framework in Environment and Planning*, July.
- Lingard, B., (1991). "Policy Making for Australian Schooling: the New Corporate Federalism", *Journal of Educational Policy*, Vol. 6. (No.1), pp. 85-90, Australia.
- Mann, H., (1848). *Life and Works of Horace Mann*, Vol.4: Annual reports, Lee and Shepard, Boston, USA
- Matthews, J., (1994). *Catching The Wave - Workplace reform in Australia*, Chapter 2 – "Competing models of productive efficiency - mass production systems, lean production systems and sociotechnical production systems", pp 25 - 50, Allen and Unwin, Sydney, Australia.
- Oakeshott, M. (1991). *Rationalism in Politics and Other Essays*, London, Metheun and Co.
- Office of Technical and Further Education (OTFE), (April 1998). "VET Policy Research", *Drivers of Change*, Australia.
- OTFE, (April 1998). *Investment in Training, Theories of Training Investment* – Chapter three, Australia.
- Pusey, M., (1991). *Economic Rationalism in Canberra: A Nation Building State Changes Its Mind*, ACT, Cambridge University Press.
- Rees, S and Rodley, G., (1995). *The Human Costs of Managerialism*, Marrickville, NSW, Southwood Press).
- Richards, C., (1998). "Quoting Roderick West Editorial Comments,– Education / Economics" *in The Age News Paper*, May 28th., p. 3., Melbourne.

- Southern Cross University, (1994). *Current Policy Trends and Restructuring*, NSW, Southern Cross-University Publications.
- Sredl, H.J., and Rothwell, W.J., (1992). *Professional Training Roles and Competencies*, Vol. II., HRD Press, Massachusetts, USA.
- Stephenson, J., and Weil, S. Eds., (1992). *Quality in Learning: a capability approach in higher education*, Kogan Page, London.
- Tomassini, M., (1997). "Knowledge Dynamics, Communities of Practices: Emerging Perspectives on Training" , *internet document* (Institut Technik und Bildung, Bremen University) at http://www.itb.uni-bremen.de/PROJECTE/europrof/default/htm
- UNESCO Wiltshire, K., (1999). Final Report, *Second Internal Congress on Technical and Vocational Education*, Seoul, Korea - April 26-30.
- UNSW Department for the Study of Industrial / Employee Relations, (1999). *Australians At Work*, UNSW, Sydney, Australia.

TEND 2000

## Crossroads of the New Millennium

# Qualification And Development Needs For Technical Education

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# Abstract

This paper discusses the needed qualification and development of teaching staff in modern technical education systems. As these systems are becoming student-centred ,then the traditional role of technical education lectureers has to be changed. The required profile of graduates based on the needs of industry and technical market needs is briefly analysed to help in setting needed skills and abilities of teaching staff in technical education institutions.The paper also discusses these characteristics in detail. Consequently, staff qualification to suit these characteristics is then discussed. Furthermore, the Omani experience in staff development and qualification setting is discussed in brief. Finally, a qualitative cost reduction mechanisms in technical education is glanced at when the right qualification of teaching staff is chosen.

# Qualification and Development Needs for Technical Education

## INTRODUCTION

As the world is entering the Third Millennium, the profession of Technical Education (TE) is becoming more and more demanding. Compared with other fields of education, the field of technical education is now more pronounced as " Career Oriented Education". In other words, one can say that TE is an education that aims at entitling its barrier for a certain vocation in the vast and rapidly changing world of technology. That's why some educators consider (TE) of all levels as " vocational education" [1], hence connecting it directly to the needs of labour market and industry sectors. As such, the traditional role of the " Teaching Staff " in technical education has changed tremendously. The abrupt changes in global technologies and market demand require non-traditional qualification for educators to be able to produce graduates who satisfy such needs.

For Oman and the Gulf Countries, the need for a sound and efficient system of TE is quite crucial. The importance of this subject arises from many reasons which include the following: lack of local technical labour force especially as the technical labour is the back-bone of the industry. The rejection of local industries to employ national graduates by claiming incompetence of these graduates. The social status of technically educated individuals by local commuinity., these factors, along with many other reasons, make the technical education as one of the top priorities for many development plans of Gulf Co-operation Countries (GCC).

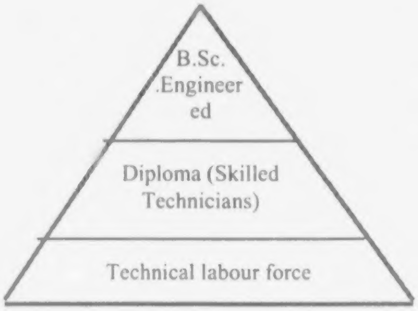
The major aim of this paper is to highlight the special characteristics and qualifications of teachers (tutors) involved in technical education profession. Some of the proposed development plans to upgrade the traditional role of teaching staff to suit the modern requirements of TE will be discussed. The expected cost reduction in TE when suitable staff are employed is also discussed. Finally, a brief discussion of the Omani experience in the field of Technical Industrial Education is presented.

## NEEDED PROFILE OF GRADUATES FROM TECHNICAL EDUCATION INSTIT

As mentioned earlier, the vast and rapid changes in global technologies, which can be seen clearly as the world is entering the 21st Century, require special profile for individuals who are seeking a career in the general Sector of Industry. This is especially obvious for the top two levels of the work-pyramid as shown in Figure 1 which demonstrates the levels of this pyramid in most technical professions specialised for the Engineering profession. The special qualifications needed for the top tow levels ( i.e. Engineers and Skilled Technicians) is now well pronounced in the demand for all industries.

For high-tech industries these qualifications are also needed for the lower level of the work pyramid (i.e. Technical labour). While these needs are still developing for traditional industries, but it will not be for long when these qualifications become a necessity.

Figure1: Work Pyramid



Based on several surveys [2,3,4] and contacts made with industries and private sectors in Muscat and Salalah Area of the Sultanate of Oman, as well as contacts with the industry sector in Jordan, we will attempt to list some of the most important characteristics and profile features needed for graduates of TE. This will help in identifying the needed qualifications for Teachers (Tutors) in the TE profession.

1- The graduate should be well-trained on self-learning technique. The expanding and changing scope of knowledge in modern industries requires individual seek enrolment in Technical sectors to be aware of up-to date on developments. Not only it is difficult for technical education institutes to teach the students all aspects of knowledge of their future profession, but also many new concepts will irrupt after their graduation and enrollment in the working sector. This requires graduates to be trained on how to acquire any new information or seek any new knowledge independently by themselves. As such, most of modern TE systems are Student-Centred Systems (SCS), thus emphasising the self-learning capabilities of the student. Graduates of such profile will be very attractive to industries since they will reduce the cost of further On-Job training and will make it more efficient.

2- The graduate have to be "well rounded" in their basic knowledge of the technical field. Since employer might decide on shifting the graduate from one line of work to another. The graduate, especially the one seeking a career in the top two levels of the work-pyramid, should have a general rounded knowledge of his/her profession. This will enable him/her to shift between different lines of work and later on to be specialised sharply utilising his/her self-learning capabilities and the on-job training programme of the employer.

3- The graduate should enjoy certain core skills, which enable him/her to progress and develop in the work environment. In any modern field of the technical profession, one should enjoy the following capabilities and skills to succeed and progress in this profession:

- Information Technology (IT) and computer skills. This includes general and specialised computer skills and capability to seek information through modern facilities like the Internet and multi media facilities.
- Communication skills (CS). The graduate has to have the minimum ability of communicating with an international language e.g. English, especially for markets of international composers like the Gulf Market. Moreover, such a skill would help the graduate to be updated with all new developments in his/her profession.
- Problem-solving techniques (PST): which include problem identification techniques, planning, and information seeking.
- Working Independently (WI) and in-groups. The graduate should be trained in teamwork procedures as well as, independent decision making techniques, as in many cases s/he cannot wait for guidance to perform a task or take a decision.

## NEEDED CHARACTERISTICS OF TEACHING STAFF IN TECHNICAL EDUCATION

To achieve the desired profile of graduates from technical education institutes, the teaching staff has to enjoy certain characteristics. This is especially true since the role of the teaching staff is changing from the traditional role of being merely an information supplier to the modern role of interactive teaching-learning process. In the modern student-centred systems (SCS) of education the teacher's (or tutor's) role is becoming that of a guide for the student. The tutor should be capable of guiding students to learn by themselves rather than just to provide them with information. The tutor is to encourage students to utilise all available facilities to acquire knowledge including labs, library, self - access centres, and even through industrial liaisons. In the classroom the role of the tutor is to provide only the underpinning knowledge which is needed to help the student in his quest for the full knowledge. Moreover, the tutor should form a living amplified example of what the student should be upon graduation. As such, and from on-hand experience in managing TE institutes at various, level the following characteristics that the teacher (tutor) should enjoy to succeed in his/her mission are concluded:

1. To be quite capable of all the core skills which are required from the student as mentioned in the previous section. In many cases tutors of high academic qualification were found to be lacking the core skills which are required from the student, especially in the IT capability. That negatively affected the educational process. The level of the tutor's knowledge should be much higher than that required from the student.

2. The tutor should be able guide students during the self-learning process. The tutor should be flexible and versatile in his/her delivery techniques to push the student for self learning process. The traditional role of a "lecturer" is no more satisfactory for the tutor since guiding and monitoring role is to be practised.

3. As the assessment process is not only exam-based, the tutor has to be capable to assess all types of activities prepared by the student This requires assessment of reports, projects, behaviour, ..etc. which needs special techniques and skills of the assessment process[5].

4. The tutor should have an on- hand practical experience with the industries related to the profession he/she is preaching. Up-to-date knowledge of developments in the profession should be always attained by the tutor. Furthermore, the tutor should have current contacts and liaison with the local industry.

5. Since TE is not quite appreciated in cultures similar to that of the GCC, the tutor should be familiar with such attidude. Being an educator, the tutor should help in changing the image and the outlook of TE which certain cultures have. As such, it is prefered that the be overcome such problems.

## STAFF QUALIFICATIONS NEEDED TO SUIT THE REQUIRED CHARACTERISTICS

After discussing the required profile and characteristic of teachers in the TE profession, the qualification that can secure tutors who might enjoy the needed characteristics are proposed hereby. These qualifications, of course, reflect the opinion of the authors of this paper based on their experience in the field and by no means can be considered as the unique approach to choose teachers in the TE profession. Furthermore, these qualifications are not listed according to any priority:

- Postgraduate (Master or Ph.D.) degree that is research oriented. This qualification would most likely secure two needed characteristics. The first is to secure a tutor with high level of self-learning skills which s/he acquired during the conducted research.

The other is that the tutor possesses high level of knowledge that allows him/her a wider flexibility in the delivery process. The tutor can approach the ideas from more than one side.

- Advanced capabilities of computer and Information Technology skills whether general or specialised according to the needs of the technical field. These qualifications can be checked either by documented evidences of the tutor's course of study and achievements , or by conducting special tests of these capabilities. Computer and Internet illiteracy cannot be tolerated in technical education for all levels and specialisations. Special knowledge for computer application should also be checked. For example, a tutor of Engineering Drawing should also be capable of Computer Aided Drafting (CAD).
- Training in special assessment techniques according to the chosen educational system. For example in the GNVQ system the tutor should have a D32/D35 assessment award [6]. If tutors do not have such awards, the educational institute should conduct training programme for such subject due to its importance.
- The tutor should have basic knowledge of main aspects of " Education Technology" or at least should be able to use various teaching aids and utilise modern teaching techniques. Training on such facilities and techniques is preferred.
- On- hand industrial experience related to the field of technical education. This can be achieved through either part-time or full-time contact with the industry. Contacts with industry sector is preferred.
- Communication and language proficiency. As mentioned earlier, the tutor has to be quite fluent in a suitable international language according to the teaching programme's official language ( e.g. in Oman it is English). On the other hand, we prefer the tutor to be bilingual to account for the local cultural barriers and foreign language deficiency among students.

The previously mentioned qualifications can form a guideline for choosing new teaching staff in TE or can help in training and development programmes of existing staff to bridge gaps.

## THE OMANI EXPERIENCE IN TECHNICAL EDUCATION

In the present section the Omani experience in Technical Education is briefly discussed. The discussion will be concentrated on the subject of staff qualification needs through the various phases of development of Technical Vocational Education in Oman.

In the Sultanate of Oman the TE institutes that provide outputs to the three levels of the work-pyramid are as follows: Sultan Qabous University, which graduates students for the higher level of the pyramid, Technical Industrial Colleges which graduate students for the second level, while Vocational Training Institutes graduate students for the third level of the pyramid. Since 1996 private institutes were formed to participate in graduating students for the second and third level of the pyramid. The regulation for private Universities already exists consequently private Universities to produce graduates for the higher level will be effective soon. However, in the present section, discussion will be confined to the experience of the Technical Industrial Colleges in Oman.. Basically the development of these Colleges have passed through three phases as follows :

**Phase I (1984-1994):** During this period there was only one Technical Industrial College in Muscat. The teaching system in this college was similar to the British Ordinary National Diploma. At that time there were only 35 staff members mostly of B.Sc. holders with some practical experience in industry. In this phase the teaching system was the traditional teaching approach where the student is on the receiver end of the learning process.

**Phase II (1994-1999):** In this phase other 4 regional colleges were established. In the 5 colleges, nearly 270, staff most of them are Ph.D. and Master degree holders, are recruted. However, the most important development was the application of a student-centred educational system, namely the GNVQ ( General National Vocational Qualification) in the five colleges. There were many challenges facing this decision but the most important one was staff development since most of the available teaching staff is not familiar with this student centred educational system. This applies for the already existing staff as well as the newly recruited ones. As such, the biggest challenge was to train around 300 staff members of all qualifications and specialisations on the new techniques of the new educational system. With the help of MANCAT ( Manchester College of Art and Technology) and the RSA ( the Royal Society of Arts ) many training and development programmes were conducted as follows:

- Interenal training: MANCAT and RSA experts conducted Many training courses for the teaching staff. Moreover, senior staff who has experience in the system conducted many in-house training. All new comers were subjected to training courses as soon as they enter the system. All existing staff have already awarded D32/D33 Assessor Award while all new comers are working toward its achievement. Those who are legible are awarded the D34/D35 internal verifier award.

- External training: Some of the permanent staff (especially Omani staff) were sent to UK to obtain on-hand knowledge in institutions already applying the GNVQ. Many of them obtained the assessors and the verifiers award from these institutions.
- Degree upgrading: nearly all-eligible Omani staff were sent on scholarship to upgrade their qualifations toward, a Masters or Ph.D. degree.

This phase continued on until an upgrade of the system is found to be in order is it is discussed in Phase III below.

**Phase III, 1999-present:** As the system progresses and local experience was gained, the GNVQ system was developed to an Omani educational programme which is called the Omani Diploma (OD)[7]. This programme also stresses the student-centred methodology while taking into consideration the local environment and constrains. The staff who gained the experience from the GNVQ is the same staff teaching now the OD. The system will be developed to a High National Diploma degree (HND) in co-operation with some UK awarding bodies. The Omani HND will also concentrate on self-learning skills along with all other requirements of modern technical education as discussed earlier. All newly recruited staff is to be chosen based on the qualifications mentioned earlier.

## COST REDUCTION DUE TO THE RIGHT CHOICE

Although there is no quantitative analysis of cost reduction in TE when the suitable staff qualification is chosen, the managers of any modern technical institute can identify the following possible mechanism of cost reduction when the right choice of the staff is conducted:

1- Reducing the in-house training and development cost of the staff.
2- Increasing the efficiency of the teaching process and reducing the ratio of staff to student outputs while keeping high standards.
3- Optimum utilisation of the existing facilities and elimination of unnecessary duplication of these facilities.
4- Utilising local environment and local industry facilities into augmenting the existing in-house facilities.
5- Reducing the non-academic management cost and the accreditation cost of the institutes.
6- Enhancement of the graduate's level at no extra cost.

The previously mentioned mechanisms along with others justify the cost of highly qualified staff in technical education.

## REFERENCES

- Deming, W. Edwards, (1982). *Out of Crisis*, Centre of Advanced Engineering Study, MIT, Cambridge, MA.
- Ernst & Young, (1996). *Oman: Private Sector Training Needs Assessment*, Bureau of Private Enterprise, US Agency for International Development,.
- Sultanate of Oman, (June 1996), *Annual Statistics Book*, Publication of Vocational Training Authority.
- Sultanate of Oman, April 1992, *Evaluation of the Training Needs for Private Sector in the Technical Field,* Publication of Vocational Training Authority.
- Dr. Pat Cryer, (1993). *Preparing for Quality Assessment Audit*, CVCP, USDU, Feb.
- "The BTEC Award Framework Guidance", *BTEC publication*, Issue 1, July 1996.
- *OD Programme Structure*, OD Steering Committee, Ministry of Social Affairs Labour and Vocational Training, 1999.

TEND 2000

Crossroads of the New Millennium

# IT As A Change Agent In Education And National Development

Prepared and Presented

By

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Workshop 2

# Abstract

It is now generally acknowledged that the Tofflerian "3$^{rd}$ wave" has displaced the preceding historic wave of the industrial revolution. Undoubtedly, technology has become a most potent force, which within this decade has redefined concepts of time, space and even reality, consequently demanding radical shifts in mindsets and paradigms. It is relentlessly and rapidly changing the way we work and live, with its effects impinging on virtually all-human transactions. The potential of IT as a change agent is undeniably great and, well deployed; it is a powerful tool.

This paper will take stock of how it has impacted on two key and inseparable areas: education and national development. In this age when knowledge is critical to national growth and success, the workforce must necessarily be well schooled. Not surprisingly, then, countries around the world are making education a top priority and investing heavily in human resource development. IT is a key player here, offering as it does both quantitative and qualitative improvements over traditional pedagogy. It has profound implications for increased as well as extended access, the latter expanding education beyond the formal to the non-formal and enabling it to move from the `life phase' to the recurrent model so necessary to sustain re-skilling and lifelong refreshing of knowledge. As important are the qualitative changes to the learning experience: the richness of resources and tools which makes possible new and innovative extension of the repertoire of teaching and learning approaches are well worth investigation.

Equally worth considering is how and to what extent these developments in education will contribute to national growth. Recently, the International Association for the Evaluation of Educational Achievement announced that its survey showed that Singapore topped the list in the use of IT in education. Singaporean students have also been repeatedly distinguishing themselves in the international arena, including the International Mathematics and Science Study. And the Singapore workforce has for many years now been ranked among the top few in the rigorous BERI survey. What is the correlation here? An examination of the causal relationships here may be informative.

How best to develop a country's human resources to meet these demands is an educational as well as political issue. What are the critical success factors? What are good strategies? How may education be best positioned to serve national needs? These are but some of the questions which can be asked and, hopefully, usefully discussed at an international conference such as this. In an increasingly borderless world, solutions must have a global perspective.

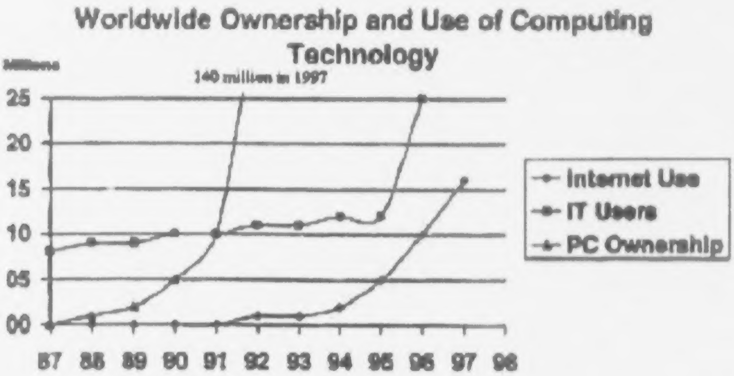
# IT as a Change Agent in Education and National Development

## PREAMBLE

### The Digital Age

IT--the 3rd wave superseding the agricultural and industrial waves—has unmistakably redefined concepts of time, space and even reality, consequently demanding radical shifts in mindsets and paradigms. Particularly in the short space of the last decade, it has relentlessly and rapidly changed the way we work and live, impinging on virtually all-human transactions. This paper focuses on how technology has impacted on two keys and closely related areas: education and national development.

With the technology becoming more and more user-centred/friendly, the rate of adoption has correspondingly accelerated, as may be seen from the table below[1].



*The Growth of Computer-Based Technologies*

(Source: NEEF, DALE (1999) A little knowledge is a dangerous thing. Oxford: Butterworth-Heinemann)

The growth has been not only quantitative but also qualitative. Progress in the technology has been nothing short of phenomenal. Moore's Law—that capability in terms of speed/power doubles every 18 months—may well become obsolete, with time becoming increasingly foreshortened. In a relatively short span, the industry has created a system that is dynamic and increasingly integrated, i.e. moving beyond personal computing and isolated systems to open and networked enterprises with tremendous implications for information distribution, communication and intra/cross-border co-operation.

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[1] Neef, Dale (1999). A Little Knowledge is a Dangerous Thing. Oxford:Butterworth-Heinemann, p40

## IT and Paradigm Shifts

Paralleling the tremendous technological growth are shifts in 3 key areas that impinge intimately and substantially on national development, viz. the geopolitical, the economic and the educational arenas. In all these three, the potential of IT as a change agent is undeniably great and, well deployed; it is a powerful tool

1. *Geopolitics*

   Major shifts in political power and alignments have emerged in the last few decades. Added to this is the IT-driven phenomenon of globalisation: the world has become increasingly open, volatile, and multipolar. As such, co-operation must necessarily coexist with competition. For instance, while countries must look to their own development, social environmental responsibilities require concerted and shared efforts.

2. *Economics*

   Market and national economics are being transformed in the 21st century. More and more, the `marketplace' is borderless, thereby creating open competition and free enterprise within which responsiveness to change and market conditions, strategic alliances, selective co-operation and outsourcing are logical solutions. To function successfully, organisations need to be info-based and info-enabled.

   > ...the future scenario would be one where success depends on having knowledge and speed in responding to changes, which will impinge on every aspect of life. (Goh Chok Tong, Prime Minister, Singapore)[2]

3. *Education*

   Toffler drew attention to the shift from economic and political/military power to knowledge. This is the information age where "more and more the economy's added value will be created by brain rather than brawn."[3]. Concomitantly, Peter Drucker's "knowledge workers"[4] will be needed, as also continuous human resource adaptation and the capability for generating, managing and continuously upgrading knowledge to cope with its exponential growth. Hence, education is key player in delivering the core competencies. The paradigm shift in education is arguably most important and fundamental; it impacts on the other domains and is crucial to national development and viability.

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[2] speech delivered at the 7th Thinking Conference, Singapore, as reported in *Straits Times*, 3 June 1997

[3] Tapscott, Don (1996). The Digital Economy: Promise and Peril in the age of networked intelligence. New York: McGraw-Hill.

[4] Drucker, Peter (1993). Post Capitalist Society. Oxford: Butterworth-Heinemann.

## IT AND EDUCATION

### IT as Catalyst - Changing Environment and Skills

The changes following upon the rapid technologically driven developments are increasingly significant and evident. With the rapid pace, the learning curve has been compressed and market-readiness--e.g. adaptability, real-time performance—is necessary. More important, the changing workplace environment of a knowledge-based society demands a change in skill sets. The traditional 3Rs need to be enhanced with other capabilities such as creativity, analytical thinking, problem solving, IT literacy, entrepreneurial/technopreneurial and other 'life skills'.

### Changing Desired Educational Outcomes

In an info-glut era, education must add value to its traditional information transfer; it is the ability to manage and use information that is critical for success. Educational aims must be redrafted to match these outcomes and the process of education reengineered. 'World ready' outputs have to meet the minimum specifications of the '3 L's':

1. *Life-skills oriented*

   Leadership, teamwork, networking, risk taking, time/stress/failure management, these are some of the necessary skills. Perhaps even more important is the mindset; we need to nurture individuals who think globally, dare to dream, have a 'can do' spirit, never say die, and are 'street-savvy' rather than just book-wise.

2. *Learning-enabled*

   Education now involves more than transmission of a body of information; it should develop the learner's ability to think and learn autonomously, and to manage his/her own learning. For this to happen, the learning culture has to be one that is learner-directed/controlled.

3. *Life-long capable*

Not only must individuals have the capacity for knowledge upgrading and re-skilling, they also need to acquire that habit of intellectual curiosity so that they will be self-directed in the life-long process of learning and prolonging the life of the mind. This involves extending education beyond the formal to the non-formal, from the `life-phase' to a recurrent model that is so necessary for life-long refreshing of knowledge.

> The illiterate of the 21st Century will not be the individual who cannot read and write, but the one who cannot learn, unlearn and relearn." (Alvin Toffler)

**Changing Paradigm**

Much has been said about the necessary shift from didactic, passive instructionism to an interactive learner-centre and learner-directed approach, and it is unnecessary to elaborate on it here but perhaps a summary of the essentials might be useful.

| Instruction Paradigm | Learning Paradigm |
|---|---|
| instructor-led/dependent/micro-managed | learner-led/self-directed |
| didactic/Prescriptive | active/discovery learning |
| extrinsically motivated | intrinsically motivated |
| Knowledge transmission/education as an end | learning how to learn/education as a means |
| Time-specific learning | continuous learning loops |
| Synchronous | asynchronous |
| classroom-bound/theoretical and decontextualised | real world/authentic problems/workplace integrated/access to practitioners |
| Coverage-dominated/curriculum-driven | mastery/distributed cognition |
| certification based on time on task | competency-based assessment |

**IT as Enabler**

The changes are; of course, not entirely the result of IT, but IT is undoubtedly a major player, both as catalyst and enabler. It has undeniable potential through the range of tools it offers—Internet with its access to vast resources/expertise, networked workstations providing collaborative and communication tools, multimedia capabilities, simulations, publishing tools, etc--changes in teaching/learning paradigms, processes and products have been facilitated by leveraging on its power. Sendov[5] identified 3 waves of IT in education:

1. *IT as a new tool/facility*

   This ranges from the relatively basic but highly efficient tools, e.g. word-processing, spreadsheets, databases, web-publishing to more sophisticated and larger-reach applications such as the those which make possible a well-organised electronic web infrastructure that can be used to capture, codify, organise, disseminate information where and when needed. Perhaps what is fundamentally significant is its interactive capability, which enables learning to be active/participative, and its "strategic agility" and tremendous potential as a communication tool.

2. *IT as valuable educational resource*

   The second wave capitalises on IT's potential for knowledge collecting and distribution and moves more clearly into the pedagogic circle, 'infiltrating' into existing disciplines though such means as CAL packages, Internet, CD-ROMs, commercial databases.

3. *IT as integral component*

   Advanced computing and telecommunications technologies--introducing email, online chats, discussion groups, computer/video conferencing, etc--have contributed greatly to the pace and magnitude of changes in the educational arena, ushering in the third wave which powers technology beyond being an accessory to being a force that shapes the very nature of the teaching/learning transaction, influencing for instance, content, methods and systems of teaching.

To this might be added a 4th and very important wave:

4. *IT and knowledge creation*

   The knowledge framework with its capacity for stimulating and supporting investigation and research generates continuous growth in our knowledge base. Medical science, for instance, has seen radical growth. Researchers, for instance, recently reported having learnt to grown brain cells on silicon chips, wiring living neurons to silicon circuitry. This could have tremendous implications for the use of electronic devices in reconnecting severed spinal cords to reverse paralysis. The decoding of human genome and the potential for gene therapy is yet another exciting area leveraging on the power of IT.

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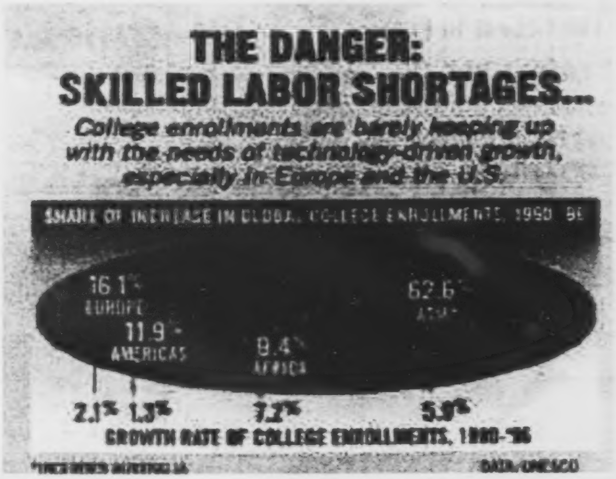
[5] Sendov, B (1986). The second wave problems of computer education. In R Ennals, R Gwyn and L Adravchev (eds.) Information Technology and Education. Chichester: Ellis Horwood

> Obviously the development of computing and telecommunications technologies has been central to this knowledge-based revolution…changes are coming about because of the way in which educated, knowledgeable, and creative people are now concentrated, rewarded and governed. It has been the mass leverage of knowledge workers that has created this global, knowledge-based revolution.[6]

## Education and National Development

More and more, economic and national health is dependent on high-ability educational systems to provide high-ability workers suitably equipped with intellectual, creative and technical capabilities. Furthermore, the challenges and problems of today demand more response from a collective intelligence, a group working collaboratively and synergistically, rather than individuals working on their own. The one-chief-many-workers model is increasingly being replaced by flatter organisations within which expertise resides at all levels. Attention to training adequate manpower is therefore imperative.



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[6] Dale Neef (1999). A Little Knowledge is a Dangerous Thing, p2.

## IT AND NATIONAL DEVELOPMENT

The connection between IT and national development—directly or indirectly via education--is easy to see.

### Infrastructure Development

In various ways IT is adding to national assets and shaping the social and economic value-added structure. It impinges significantly on social interaction, communication, business transaction, leisure options and other domains. While there are some misgivings, it is generally conceded that an IT-supported environment is a better living and business environment.

> IT will bring democracy to China…pushing in order to open up Chinese society…. There is no question that with the spread of the Internet and globalisation, the spread of information, there is no way to keep that out of China if China is going to compete economically…(Madeline Albright)

### Economic Growth

An efficient IT-driven communication infrastructure is important in a knowledge-based economy that is highly dependent on fast and timely information flow and distribution. More specifically, technology supports and sustains economic growth in such ways as enabling increase in productivity and efficiency (e.g. through IT-supported administrative procedures), cost-effective use of knowledge/expertise through rapid/large-scale skills transfer, enhancing quality assurance and stimulating innovation in industry.

IT is also clearly critical to the management of globalisation. And with the need for agile responses to rapid changes in the `marketplace' and its dictates, whether the `high road' (larger and more global) or `low road' (smaller and domestic) will substantially determine the wealth of nations.

## CASE STUDY: THE SINGAPORE EXPERIENCE

### Singapore: a `Smart' Island?

The IT scene is certainly very vibrant. Singapore is rated among the 10 "hot new top tech cities"[7] and ranked 4th out of 55 surveyed worldwide[8]--based on computer and Internet usage, social aspects of IT and government policy—and expected to move up to 2nd place in 2001. PC/Internet penetration is relatively high, ahead of such countries as US, Australia and Japan[9].

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[7] *Newsweek* Nov 9, 1999

[8] survey conducted by International Data Corp

Its **IT 2000 Masterplan** is a fairly ambitious one which includes, among other things:

- setting up a host of multimedia services—e.g. Internet, video-on-demand--at rates made competitive by liberalising telecommunications and inviting multiple service providers;
- building `Singapore ONE'—Singapore-One-Network-for-Everyone—which provides a national high-capacity broadband network platform to transform Singapore into an intelligent environment with state-of-the-art technologies delivering a potentially unlimited range of multimedia services to the workplace, school and home. Offering a host of incentives--such as preferential tariffs for broadband connectivity, tax incentive, investment allowance, subsidy under the Innovation Development Scheme, joint publicity programmes--it has secured the participation of fourteen leading content, service and technology providers (Microsoft, IBM, Sun Microsystems, Motorola, HP, etc). Broadband, ATM backbone with core ATM switching are now in place to support high volume electronic traffic and a host of applications and services, including high-speed Internet services, online access to government agencies, school curricula and educational information.

### IT and the Singapore Education System

IT is evidently a key player. It is one of the three priorities for Singapore education system, the other two being thinking skills development and national education.

### IT-for-Education Masterplan

The Masterplan for IT in education is underpinned by the belief that education should anticipate and address the future needs of society. Launched in April 1997 with a S$2 billion budget, provides the blueprint for integrating technology into teaching and learning and aims to create `smart' schools by 2001. It defined 4 key dimensions:

1. curriculum and assessment

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[9] survey by Infocomm Development Authority of Singapore, 4th IT Household Survey (June 99)

- PC: Sing (59% of households), US (54%), Aus (47%), Japan (42%)
- Main uses of computer: email (87%), games (56%), info retrieval on hobbies (35%)
- Internet penetration: Sing (42%), US (40%), Aus (22%) Jap (13%)
- Main uses of Internet: email/chat (87%), info retrieval (70%), news (25%), web applications (20%), online gaming/watching movies (17%)

2. content and learning resource
3. physical and technological infrastructure
4. human resource development (Core Training for all teachers)

The push to leverage on IT for teaching and learning has been unremitting and there is substantial progress:

| | |
|---|---|
| **Phase I: 1997** | IT was integrated into the curricula of 10 primary and 10 secondary schools and 2 junior colleges, with it forming at least 10% of the curriculum time. |
| **Phase II: 1998** | 106 schools came on board. |
| **Phase III: 1999** | Further investments in start-up hardware, networks (e.g. whole-school networking), software and courseware, training of teachers, and upgrading facilities for high speed Internet access. 230 schools became involved in integrating IT into curriculum. |
| **by 2000** | Projected student:computer ratio is 6.6:1 in primary, and 5:1 in secondary schools. Core training for all teachers is expected to be completed. |
| **by 2002** | The targeted student:computer ratio will be 2:1, and 30% of curriculum time will incorporate IT. |

### IT-Supported Education in Singapore: a Success Story?

The way we teach and the way students learn is slowly but surely changing, slowly because it is never easy to change mindsets and old habits die hard: we teach as we have been taught. But IT-mediated changes are becoming evident and gathering momentum. IT-mediated changes are gathering momentum and becoming evident, notably in the following ways.

- *It has expanded the repertoire of tools.*

  i) Administration

  The Electronic Office Management System at the National University of Singapore has simplified and expedited registration for courses and examinations, result retrieval, student feedback, and provided electronic records and workflow management in such areas as payment, leave applications, research project submission, research publication updates, work order requests, stationery requisition, and software acquisition.

ii) Presentation

IT-enhanced presentations, facilitated by upgrading of software and equipment has introduced a level of sophistication not known in the pre-Powerpoint era. Some feel, however, may not be more than a cosmetic change and have asked: "where's the power and what's the point". This reinforces the importance of pedagogy-driven applications and uses; care must be taken so that IT is not the proverbial tail wagging the education dog.

iii) Communication

This is arguably the most significant. With Internet and Intranet with client/server-based integrated information systems, communication—including real-time interactivity through ICQ, chat rooms, videoconferencing, web-conferencing, etc—is greatly enhanced. With multimedia technologies, high performance computing and visualisation support and high volume data transfer services, the potential for alternative delivery systems is great. More and more, live sharing of applications and documents is providing the edge over the "relatively slow e-mail".

- *There is greater variety and flexibility in the delivery system.*

The technology has arrived at a level of maturity where it is possible to have anytime, anyplace access, creating effective an expanded and potentially borderless learning space and prompting redefinition of the `classroom'. Worth noting too is the move from 1-way delivery to increasingly greater degrees of interactivity. As real mastery is more likely to derive from active engagement, this is an important consideration. The National University of Singapore, as an example, has introduced a number of initiatives, e.g.

- ○ Integrated Virtual Learning Environment: a web-based environment housing course web sites (866), Course Outlines (1201), 245 Discussion Forums (245);

Chat Rooms (96); Workbins (114)[10], on-demand services such as video-on-demand and lecture-on-demand; remote lecturing: `live' webcasting of lectures (July-Oct '99: 116 full lectures).

- `Global campus': a project introducing ubiquitous access through >8000 Plug-&-Play live network points located throughout the campus.
- notebook ownership scheme: loans are provided to assist students in acquiring personal notebooks, with support service and technology built into the package.
- distance learning, e.g. a Master's course in electrical engineering for Motorola engineers delivered through multimedia conferencing via the Singapore-ONE network.
- `Global Learning Consortium': a hub for international learning network promoting exchange of learning programmes of which the university if a member.

The other tertiary institutions in Singapore are likewise strongly committed, and likewise have adopted technology not only for on-site but also distance teaching and collaboration on project work. Singapore Polytechnic's `Virtual College' offers courses taught using the Internet, Temasek Polytechnic's Centre for IT in Education and Learning has an `Online Learning Environment` for delivering a range of internal and external courses. Ngee Ann Polytechnic's `NP-ONE' is a web-based, adult industrial training programme delivered in the distance mode.

There is also a high level of activity in the schools. Not only is there computer-supported learning (e.g. virtual laboratories, the multimedia, content-rich `Student-Teacher Workbench') but there are also efforts at using IT tools for cross-classroom activities. Raffles Girls' School is offering some classes on the net so that students across the island can learn in the virtual classroom of this premier school. Collaborative learning is gaining momentum, e.g. the `Asia-Europe classroom' brings together 25 schools worldwide to learn interactively via Net telephony and videoconference, the AT & T virtual Classroom has been set up for a multi-party global water study. Various software which allow students to work on projects with students in other countries have been developed/adopted to facilitate such collaboration. Schools are also aggressively exploring new technologies. For instance, Raffles Girls School, worked with Hewlett Packard in an e-learning project in which students doing all their schoolwork on hand-held PCs (Jornada) supplied with a wireless network card, offering e-mail, Internet, word-processing, spreadsheet presentation and organiser functions. This is now taken to a larger scale and user population with the development of another wireless communication device: the Edupad (15 MB, 800 gm) which has capabilities for internet access, e-mailing, scheduling, etc. and functions also as a notepad with handwriting recognition software. With this also comes the possibility of highly portable digitised textbooks.

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[10] The numbers were taken in October 99.

There are also commercially driven projects, such as live interactive tutoring and `Educast' which is an educational programme for children combining TV, radio, Net-based interactivity.

- *Instructional materials and approaches are enriched.*
  Web-based lessons, electronic discussion groups have increased the instructional repertoire. Multimedia technologies, online resources and CD-ROMs have the potential for more interesting/multimedia recreations. For instance, some history lessons are available online via Singapore-ONE, and virtual labs for online simulated experiments have been set up and may be accessed from home. With the emergence of new technologies and the viability of networked multimedia platforms and virtual environments, there is new scope for reassessing and deploying the IT resources for on-site and distance teaching/learning.

- *Knowledge base has increased.*
  Improvements in protocol and interoperability have contributed greatly to increased access to Internet-based and Web-based resources. Through links to corporate databases, file servers, and document repositories, broad-spectrum information is made available to users through a single, transparent front end. IT-enhanced digital libraries bring information through a network of borderless libraries and information providers to supply timely information, resources and library-related services in an integrated, transparent and convenient manner.

- *Distribution of and access to information has been extended.*
  As the technology becomes more affordable and accessible, the whole issue of access to education takes on new possibilities, with implications for knowledge sharing and equity. Of course, the issue of equity is a rather fraught one and much has been said about technology creating the great divide between the haves and have-nots, but that is subject for another paper.

The bottom line is that, reservations and qualifications not withstanding, there is impressive evidence of the transformation of teaching and learning through such means as:

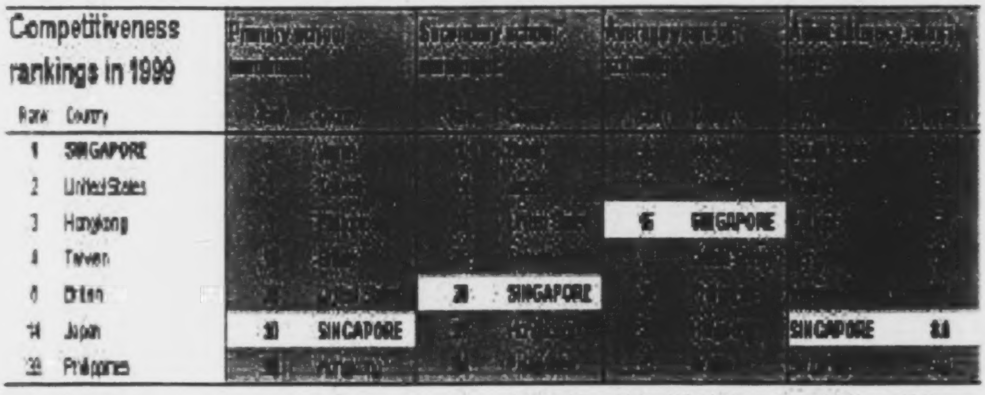
- enhancing course, curriculum and learning; (from text to multiple representations, from passive reception to engagement; classroom to real world;
- providing efficient/cost-effective information-transfer which then frees up time and energy for developing higher order cognitive skills, thereby serving as catalyst/enabler of quality learning experiences.

The real long-term academic benefit of IT will be what it brings to pedagogy and the curriculum, e.g. whether the additional resources enhance the instructional tools used by teachers and the learning experience of students.

## Education and National Development

> Astonishing developments in information and communication technology (ICT) in the past few years… (means that) companies that are slow to react to these changes lose their market share quickly…. Speed, information and entrepreneurial dare are now the key success factors of a knowledge-based corporation. (George Yeo, Minister for Trade and Industry, at the opening of Dell Computer's Web Farm, 16 Feb '00).

Recognising the core competencies necessary for survival, Singapore invests heavily—20.52% of total government expenditure--in education[11] of national spending in education, and is constantly looking at how its educational system might be kept relevant and `cutting edge' so that it can produce the requisite manpower. It seems to be succeeding fairly well in this, judging from this competitiveness ranking for 1999.



Competitiveness rankings in 1999

| Rank | Country |
|---|---|
| 1 | SINGAPORE |
| 2 | United States |
| 3 | Hongkong |
| 4 | Taiwan |
| 8 | Britain |
| 14 | Japan |
| 32 | Philippines |

15 SINGAPORE
20 SINGAPORE
10 SINGAPORE
SINGAPORE 8.8

NOTE: ¹ [illegible]

Source: WORLD ECONOMIC FORUM and UNDP HUMAN DEVELOPMENT REPORT [illegible]

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[11] expenditure on education: S$3944.04 million (operating) and S$2006.89 million (development); total: S$5950.53 million, 2nd only to defense (S$7423 million); approximately 22% of total government expenditure: S$28994.94 million (Budget 2000 announced in parliament, 25 February, 2000), 3.6% of GDP;

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Singapore's educational system is predicated on both developmental and functionalist assumptions: it serves both personal as well as national needs. This is evident in the articulated functions of its universities which are all public institutions,

1. to produce the graduate manpower for our high-tech, knowledge economy
2. to educate Singaporeans to be global workers but local citizens contributing actively to Singapore
3. to be creators of new knowledge and applications.

As Deputy Prime Minister, Dr Tony Tan, emphasised

> As we make the transition to a knowledge-driven economy, intellectual capital is a key factor of production which increasingly contributes to the bulk of economic returns.... A mark of a world-class university is its first-rate research...to generate high tech spin-off companies and produce graduates who can create their own jobs. (lecture at Chulalongkorn University, Thailand, 14 Jan '00)

A great deal of attention to improving the educational level of its population. The numbers going for tertiary education continues to increase and presently represents about 20% of each cohort of students. About 10000 enter the local universities, 5000 go to institutions overseas, 1400 are enrolled in the Open University degree programmes and a substantial number[12] are pursuing programmes by distance learning. Additionally, about 18000 attend the polytechnics and nearly 4000 enroll at the Institute of Technical Education.

Attention is also being given to non-formal education, particularly to on-the-job training, skills upgrading and re-skilling. One novel initiative is a coach equipped with computers and digital cameras which visits factories all over the island to teach workers IT skills. On a much larger scale, more than S$50 million go into the Skills Development Fund, Education and Training Fund, and employers are also strongly urged to provide for training and development of their employees. The Public Utilities Board, for instance, recently announced that it will invest S$3.6m on training its staff to be multi-skilled and nimble workers who can adapt to new technologies, budgeting on about $1700/head and 12.5 days training per employee/year. This emphasis on life-long learning for continuous knowledge/skills refreshment has contributed to a long shelf-life workforce.

### IT ⇔ Education ⇔ National Development

While there is as yet no conclusive empirical evidence, there is reason to believe in the causal relationship among these phenomena:

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[12] In 1998, 18000 took external basic degrees, while 4400 took external higher degrees.

- Singapore topped list in use of IT in education (International Association for the Evaluation of Educational Achievement survey).
- Its students fare very well in international ranking (e.g. at international competitions and surveys such as the International Mathematics and Science Study).
- Its workforce has for 20 years running been ranked #1 in the rigorous BERI survey.
- *Fortune* and the Economist Intelligence Unit rank Singapore as Asia's "top business city".

Somewhat more controversial is the growing complexity of social systems. Globalisation has implications for traditional national boundaries and values which need to be addressed. In an increasingly borderless world where people become citizens of the world, national identity and loyalties may become less clearly defined. That Singapore is aware of this is reflected in the inclusion of such clauses as "think globally but rooted in Singapore", "love Singapore", "Know and believe in Singapore" in the definition of the `Desired Outcomes of Education' formulated by the Ministry of Education in April 1998. How well the introduction of national education as a strategy for achieving these outcomes remains to be seen. A recent study indicated that most Singaporeans are proud to be Singaporeans, but 1 in 2 Singaporeans also see themselves as citizens of the world.

## CONCLUSION

There is little doubt that IT can be a powerful and positive change agent. . As with all powerful tools it has to be used judiciously. Well deployed it can improve the quality of life; ineptly applied it will be costly and counter-productive. Some critical success factors might be shared here.

### Some Critical Success Factors

In 1999, Singapore spent about 2.5% of its GDP on IT, and though it is only approximately half of the figures for countries like US and UK its venture into IT is nonetheless a fairly ambitious one. Its experience in the implementation of its national IT Masterplan and the IT-for-Education Masterplan has been generally favourable. That this is so may be attributed to various factors, including attention the following.

### *Goal definition*

This makes possible a shared vision and concerted efforts at arriving at common goals. Particularly where education is concerned, being focused on the learning outcomes helps to ensure that the technology does not dazzle and distract, is pedagogy-driven, integrated into the curriculum and focused on the essential, namely education.

### *Leadership/Management*

For clear directions, there needs to be strong and visionary leadership. Technology is costly and isolated 'small players' will not be cost-efficient. 'Top level' decision-making and support will mobilise a critical mass for expeditious implementation. Furthermore, it is not enough for management to support but it must also be seen to support, either through resource provision or the reward system.

### *Ownership*

While top-down decisions are efficient, effective implementation requires also the 'buying in' of all stakeholders. In the educational arena, for instance, success of its IT Masterplan depends on not only providing the infrastructure and hardware are but also commitment from teachers, students, the parents, employers, i.e. all involved in either the front or back end of the educational process. Hence, at the National University of Singapore, for instance, much effort—through 'road shows', workshops, seminars, forums, etc--goes into informing users of available IT resources and how these might be usefully deployed for teaching and learning.

### *Infrastructural provisions*

As has been said, there is no such thing as too much bandwidth or too much memory. The more the technology advances, the greater the demands on it. The introduction of ADSL and broadband to Singapore did not satisfy the clamour for quicker and yet quicker access, so in a sense no provision is ever adequate. However, some minimum requirement must be met, such as affordability, user-friendliness, and a fair degree of system robustness and established standards and protocols.

### *Training*

It is obvious—and perhaps often overlooked because of its obviousness—that merely providing people with hardware will not be productive if users are not ready. Training and user-support are critical.

*Incentives*

This is another obvious critical factor: changing mindsets and habits is difficult. Unless there are perceived advantages inertia will prevail. In education, for instance, courseware development is time-consuming and unless there is commensurate recognition built into the reward system, progress will be slow. At the National University of Singapore, for instance, such efforts are being taken into account in the annual staff review and awards are also given. If the suggestion for time-off for development is taken, it should be a powerful motivator as, often, the spirit may be willing but time is the constraint.

*Monitoring and evaluation*

One danger with the rapid pace of development is that it is only too easy to be so engrossed in keeping up that critical functions like monitoring and evaluation are neglected. It is useful to heed Stephen Ehrmann's[13] warning that "without asking hard questions about learning, technology remains an unguided missile". Building accountability in services, support and usage of IT resources, establishing mechanism for checking that developments are on target and on course, periodically evaluating (cost-benefit analysis, surveys, etc), are some ways of avoiding falling into the pit.

## Some Concerns

Increasingly, questions are raised about how IT may impact negatively on the quality of life. At a macro level, it can widen social inequality, and may create problems of national identities and loyalties in a world moving towards borderlessness. It can pose real threats to privacy and produce pressures of knowledge explosion and 'infoglut'. It can alter the texture and quality of human interaction: reducing human interface and with it the atrophy of communication skills and the transmission of values traditionally effected through interaction. An increasingly virtual society wherein it is easier to evade social and moral accountability can contribute to value erosion and increase in crime rate. Techno-addiction, cyberporn are some of the less desirable parts of the vocabulary of the information age.

There is also the danger that `glitzy' technology may seduce us into thinking that IT is the ultimate solution whereas 'smart' machines do not automatically/necessarily effect learning, not get the job done. Technology is a tool, and there has to be very clear-sighted vision of how best to use them to achieve the desired goals. A great deal of thinking has gone into this, but a great deal more needs to be done, as there is as yet no definitive model.

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[13] manager of the Educational Strategies Program at the Annenberg/CPB Project in Washington, DC

In sharing Singapore's experience, some good practices have been identified. Undoubtedly there are others, just as there are also pitfalls to consider. The recent visit of the Prime Minister of Singapore to the UAE highlighted the interests that the two countries have in common, and the potential for co-operation in various important areas including Internet development, e-commerce and human resource management. It follows that the sharing of experiences is likely to be mutually useful. But beyond that, the experiences should also be of interest at a global level in view of the inescapable interconnectedness of the world today. An international conference like this, therefore, provides good opportunity for collaborative learning and it is hoped that this paper will trigger fruitful discussion.

TEND 2000

## Crossroads of the New Millennium

# Decision-Makers At The Crossroads: Changing Quantitative And Technological Tools

Prepared and Presented

By

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Monday 10 April, 2000

## Workshop 2

# Abstract

Decision-makers have always relied on a mixture of qualitative and quantitative information. The past century has seen a steady increase in the use of quantitative arguments. Recently, however, two technological tools—spreadsheets and the Internet---have dramatically altered the way in which decision-makers analyse quantitative information. Spreadsheets make the manipulation of large quantities of data possible by non-specialists; the Internet makes data easily accessible.

Since changes in technology affect the way quantitative methods are practiced outside the classroom, we expect also to see changes in the classroom. This has started to happen.
For example, finance courses now use spreadsheets and statistics courses often use data from the Internet. What does this mean for the prerequisite quantitative courses? Significant curricula change is needed to prepare students to use these tools effectively. In particular, numerical methods, data interpretation, and simulation should be introduced into the curriculum.

This workshop centres on the quantitative preparation required by the next generation of decision-makers. It describes new courses at Harvard's Kennedy School of Government and the University of Arizona.

# Decision-Makers at the Crossroads: Changing Quantitative and Technological Tools

## THE ART AND SCIENCE OF DECISION-MAKING

Wise decision-making has always been both an art and a science. There is art in valuing a particular choice and in understanding an individual's reactions. There is science in analysing data and in predicting consequences. There is judgement in balancing the two.

Decision-making will remain both an art and a science. However, the scientific aspect of decision-making in business and public policy is currently changing. The implications of these changes for education are discussed in this paper.

## A FRAMEWORK FOR DECISION-MAKING

In everyday life, making a decision has two stages: laying out the alternatives and choosing one of them. The more complex decisions of business or government can be analysed using the following five-stage framework due to Edith Stokey and Richard Zeckhauser: [1]

a) *Establishing the Context.* What is the underlying problem? What are the objectives?
b) *Laying out the Alternatives.* What are the possible courses of action? What additional information would be useful?
c) *Predicting the Consequences.* What are the possible consequences of each course of action? How likely is each?
d) *Valuing the outcomes.* By what criteria do we measure the value of each alternative?
e) *Making a Choice.* What is the preferred course of action?

Quantitative information can enter into the decision-making process at any of Stokey and Zeckhauser's stages. For example, establishing the problem underlying a stagnant economy involves analysing economic indicators. Laying out educational alternatives requires the computation of enrollments and budgets. Predicting the consequences of increased tariffs involves using a quantitative economic model. Deciding where to build a new power plant involves evaluating the efficiency of various locations. Making a choice of the final course of action often involves balancing quantitative and qualitative information: Which investment promises the greatest yield, given past performance? Which investment is most likely to outdo its past performance? Which investment is in a company with the strongest record of community support? Thus, changes in the way in which quantitative information is analysed could affect every stage of the decision-making process.

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[1] Edith Stokey and Richard Zeckhauser, *A Primer for Policy Analysis*, p.5, (New York: W.W. Norton, 1978).

## THE CHANGING TOOLS OF QUANTITATIVE ANALYSIS

The mathematical tools available to decision-makers have expanded greatly over the last hundred years. Statistical methods came into wide use during the twentieth century. Much of operations research, such as linear programming, was an outgrowth of the Second World War. The mathematical theory of decision analysis began to be used by businesses in the early 1960s.[2] Finance has become much more mathematical, with some spectacular successes. For example, Black and Scholes' work in the1970s led to the development of the market for stock options.

Until recently, these new quantitative methods did not greatly affect the day-to-day decision-making of many business executives or public servants. Some methods were too hard to apply; some required too much background in mathematics. For example, not long ago, statistical studies required a mainframe computer and therefore particular expertise. Linear programming[3] could be done by hand, but not easily, or by a special purpose computer programme. Thus, although these new quantitative methods showed great promise, until recently they were more widely used by quantitative specialists than by practitioners in the field.

In addition to the technical difficulty in employing quantitative methods, decision-makers of the past decades did not always have accurate data. Decisions are only as good as the facts on which they are based. For many years, governments have tried to collect reliable data, such as census, health care, and economic data. Individual decision-makers, however, have not always had access to this data, either because they could not pay for it, or because they could not get it fast enough. Even organisations which collected data did not always use it fully, as the amount of data collected often outstripped the techniques available for analysis. For example, the scanners at a supermarket checkout desk collect vast quantities of data that is not fully analysed.

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[2] Howard Raiffa, *Decision Analysis,* (Reading, Mass: Addison-Wesley, 1968).

[3] The name *linear programming* suggests computers; however, this is not its origin.

However, two recent developments dramatically affect how quantitative information is handled. The first is the advance in computer technology, particularly spreadsheets. The second is the Internet. These two tools put data analysis within the reach of non-specialists.

The Internet provides decision-makers with access to up-to-date facts in way that the telephone and regular mail cannot match. Data on the Internet is often easy to obtain; for example, stock prices can be downloaded directly into a spreadsheet. Not only is data easier to get than it used to be; it is also easier to analyse. A spreadsheet can be used to display data graphically and to do statistical tests and probability computations. Policy makers who want to know population growth rates or an economic indicator can now make the computations themselves. Thus, spreadsheets and the Internet should now be considered essential tools for *all* commercial and governmental decision-makers. A future decision-maker who cannot use these tools will be at a significant disadvantage.

## IMPLICATIONS FOR EDUCATION

Since technology now enables decision-makers to use data easily and effectively, colleges must evaluate whether their graduates are learning the technical and quantitative skills they currently need. In countries where computers are widely available, young students have shown a remarkable affinity for them. This is reflected in the number of very young programmers found in many software companies. However, students who can make stunning web pages, for example, cannot always use computers to work with numbers.

John Maggio, Professor and Chair of Pharmacology at the University of Cincinnati Medical School, finds medical decision-making hampered by medical students' lack of skill with computers and quantitative arguments. He reports:

> "The idea of using computers for something other than email or downloading documents to print is one that only a minority of our class is comfortable with. When Step I of the Boards (the first of the exams toward licensure) went to computer format last year, some of our students were very concerned, far beyond the usual worries when a system changes that the new system will have glitches.
>
> I would say there is also a surprising level of illiteracy about things numerical. Even quite simple equations elicit fear and loathing in a small but significant fraction of the class. The number of incidents due to miscalculated drug doses (a very real problem)

becomes more understandable after one talks to the few students who take this attitude."[4]

Poor decision-making in medicine affects the health of patients. Poor decision-making in commerce and government affects the health and development of companies and countries. The challenge we face is to give all future decision-makers the skills to use quantitative methods well.

## MEETING THE EDUCATIONAL CHALLENGE

To understand this educational challenge, we first consider the current focus of most mathematics teaching. Although many of Newton's arguments were geometric, calculus and most subsequent mathematics are usually expressed symbolically. Thus, much of the mathematics learned in high school and college is symbolic manipulation. Recall, for example, solving equations and simplifying expressions in algebra, or calculating derivatives and integrals in calculus.

Computers, however, tend to shift the emphasis away from symbolic manipulation towards numerical methods. This has significant implications for the teaching of mathematics. For example, numerical methods to solve equations and approximate integrals are not likely to be familiar to students from a traditional curriculum. Similarly, students trained on symbolic manipulation may have little understanding of round-off error, which plays an important role in most numerical approximations.

What does this mean in practice? It does *not* mean that we should stop teaching symbolic manipulation. Since spreadsheets use formulas, understanding algebra is essential for learning to use a spreadsheet. It does mean, however, that students need experience with numerical methods on the computer as well as with symbolic manipulation.

There are some very difficult questions, which I will not deal with here, about whether the amount of symbolic manipulation taught should be reduced, and if so, by how much. The answers to these questions are not yet known. There is currently little understanding of how much practice with symbol manipulation is necessary for conceptual understanding. Research is needed on the link between symbolic skill and the ability to interpret data. However, even without the answers to these questions, it is clear that future decision-makers need more experience with numerical methods than they currently get.

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[4] Personal communication. January 31, 2000.

Computer technology gives decision-makers two other new tools: simulation and the ability to do statistical calculations. A simulation enables users to get a feel for a phenomenon that is hard to analyse theoretically. There are dangers, of course, in working with phenomena whose theoretical underpinnings are not well understood. However, these are dangers that are faced regularly by decision-makers in the field; they should be encountered first in academic work.

The place of statistics in the curriculum varies with the country. In the US, statistics has traditionally been taught as though it were less important than calculus. For decision-makers, this most emphatically not the case. However, many institutions are now updating their curriculum to give statistics more emphasis.

In conclusion, our future curriculum should include numerical methods, an introduction to computer simulation, and statistics. In addition, we can no longer allow only the students going into mathematics and science to become skillful users of quantitative arguments. Such arguments now underpin successful decisions in business and public policy. Students of commerce and government must become equally skillful.

## EXAMPLES OF NEW CURRICULA AND PEDAGOGY

My TEND2000 workshop centres on possible responses to this challenge. Both the business mathematics sequence at the University of Arizona and the Summer Programme for Public Administrators at the Kennedy School of Government at Harvard have been redesigned recently, with the goal of producing decision-makers able to use the new quantitative and technological tools.

Both courses share a common philosophy and use similar tools. Both courses are driven by projects that allow students to use these tools in the context of a realistic decision. However, they serve very different students. Harvard's programme is offered by the Kennedy School of Government as an introduction to its Master's Programme in Public Administration. Its students are mid-career students with much practical experience, but who often have not had mathematics recently. The Arizona programme was developed through an extensive collaboration between the departments of mathematics and finance, but is offered by the department of mathematics. Its students are undergraduate business majors.

Participants in the workshop have the opportunity to see materials from Richard Thompson and Chris Lamoureux's business mathematics[5] at Arizona and from the Information, Data, and Decisions course at Harvard.[6]

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[5] See http://www.math.arizona.edu/busmath.

[6] Designed and written by Eric Connally and Deborah Hughes Hallett.

TEND 2000

## Crossroads of the New Millennium

# The Globalisation Of Education

Prepared and Presented

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Workshop 2

# Abstract

Integrating the graduate into the global educational community is required by advanced communications, international trade, and international travel. However, there are challenges and dangers in globalising education: the process of recruiting foreign students can be merely an entrepreneurial activity by universities to generate revenue to improve sagging budgets; the quest to maximise enrolments can mean a decline in quality; mistakes with staff exchanges can be expensive and hurtful; the speaking and using of the English language exclusively can be culturally arrogant; and cultural dumping which is often the unintended imposition of a culture on a developing country can be detrimental.

Internationalising education presents another dimension which I describe in terms of a hierarchy of values. With such person-respecting values, the globalisation process is transformed creating in us a fundamental humility with the learning and wisdom of other cultures, a respect for the needs of our students and faculty, and a desire to be with others for creative learning engagements. This is not a vague eclecticism but a strategic initiative requiring us to be authentic within our own culture and willing to engage meaningfully with others who remain equally authentic. The relationship develops when the dialogue is honest, constructive and collegial.

# The Globalisation of Education

Is it international adventuring? Is it a new form of colonial exploitation? Or, is it merely a consequence of government shortchanging university education? What is the truth about the globalisation of education?

Those of us who embrace this dimension of education have a responsibility to explore and justify our values, motivation and commitment.

Globalisation is the standardising of products, processes, systems and services throughout the global village. Fast foods such as McDonalds and Coca-Cola, clothing fashions, television, Internet surfing, music tastes, automobiles, and international travel manifest the globalisation process. A standardised free-market ideology is achieving global dominance. The United Nations and World Trade Organisation are promoting standardised activities. And some mega-universities are seeking global dominance with the Internet. Thus geographical, historical, sociological and cultural differences are becoming less significant and our integration into the global community more crucial.

The globalisation of education appears in various forms – mostly with worthy consequences, although the motivation has not been deliberately value intending. Some examples:

- Recruiting full-fee-paying overseas students often reflecting a need to balance the budget in the face of declining government funding.
- Developing internationally portable credentials, enabling our graduates to more effectively secure vocational opportunities within the global village.
- Research contracts involving academics from different countries, sometimes in collaboratories.
- Student and faculty exchanges and twinning arrangements.
- Two hundred thousand programmes on the Internet provide knowledge and information to anyone, at any time and anywhere to people with means. AUT has 40 subjects available and we are members of a web-based consortium called the Global University Alliance.
- Exchanging curricula, providing moderation, engaging in institutional strengthening, and securing consultancies for development work through the Asian Development Bank.
- Globalisation is a reality. These activities are crucial. So it is appropriate that we embrace it and succeed within it. In fact, for many of us there seems little alternative.

Thus, if we are teaching marketing to our students, we will help them succeed in being effective by explaining the entrepreneurial advantages of global awareness. We might illustrate this by describing failed advertising campaigns. Vauxhall attempted to market their car called "Nova" in Spain, without realising "Nova" in Spanish means "will not go". Guinness attempted to market Stout as a man's drink in Hong Kong ignorant of the fact that in that city "Stout" referred to a medicine given to pregnant women.

There are risks and difficulties with the globalisation of education.

- Full fee paying overseas students may not yield a huge income. These students require a great deal of extra assistance which is expensive. Politics can interfere. For example, during the Gulf crisis, Iraq stopped paying for 1,000 students studying in Great Britain, creating severe financial problems.
- Two events in New Zealand brought enrolments from Japan to a standstill. Mt Ruapehu erupted and the media portrayed it as if New Zealand were blowing up. Then New Zealanders protested strongly against French nuclear testing in the Pacific. It was assumed that New Zealand was being contaminated by radioactive poisons when, in fact, Japan was closer to French Polynesia.
- We arranged a faculty exchange with a Chinese teacher. All correspondence was in excellent English but when he arrived he did not speak a word of English. So we had to employ an interpreter. Classes moved slowly annoying the students. Also, his expertise did not match that of the teacher he exchanged with. So we had to employ temporary lecturers to help teach. Then, we had to continue paying the salary of our colleague overseas because the income he received was no more than an inconvenience allowance. And we had to pay a New Zealand salary to the visiting lecturer. So it was a very expensive exercise, albeit worthwhile as an international learning experience, and as a personally interesting occasion for those involved. But it certainly stretched our budget.
- Sometimes the insensitivity of teachers means that the host culture is "dumped" on the student as if it is the only legitimate form of cultural expression.

However, I support the view that globalisation can provide the basis for internationalisation which is a different phenomenon. The term "internationalisation" describes a process that adds value to the globalisation process. Instead of just accepting the realities of globalisation, the process is transformed to construct positive, synergistic and creative collegiality, thereby purposefully and strategically enhancing the human experience.

The logic of this linguistic manipulation can be explained with reference to New Zealand. We can identify 156 different resident ethnic groups, but this does not mean we have a genuinely internationalised society. We are educated, organised, socialised and governed according to the increasingly pervasive values of the Anglo-American diaspora. We have a relatively, but not entirely tolerant, mono-cultural society which largely ignores and, thus, inevitably and unconsciously negates the existence of other cultures.

To add value to globalisation and construct this "internationalisation" we need to have developed a hierarchy of values. Being subjective, this list will not be a definitive moral calculus. But, because it provides a framework for our ethical reasoning, it enables us to make judgements within contexts, especially where there are conflicting values and where some compromise is required.

The hierarchy of values I endorse seems to me to echo the values of wisdom literature of the ages. Its tenets are as follow.

1. Respect for people, their perceptions, values, integrity and being.
2. Respect for nature.
3. Respect for the whole context
4. Respect for the survival of the human species.
5. Respect for the past and future as well as the present
6. Respect for the community, its organisational structure and its well being, involving co-operative relationships.
7. Respect for justice, equality of opportunity and peace.
8. Respect for individual responsibility, personal freedom, and autonomous decision-making.
9. Respect for the careful stewardship of resources, including efficiency and effectiveness.
10. Respect for creative enterprise.
11. Respect for responsible and sustainable productivity.
12. Respect for professionalism, achievement, quality and excellence in the performance of tasks.

This hierarchy of values helps us establish a concept of transformative education, an education which purposefully makes a difference in terms of the preferred value system and includes such principles as the following.

1. Respect for self-reliant, student-centred learning.
2. Respect for holistic learning.
3. Respect for co-operative learning.
4. Respect for creativity in learning.
5. Respect for ecological learning.
6. Respect for mastery learning.
7. Respect for culturally sensitive, internationalised learning.
8. Respect for intellectual rigour and discipline in learning.
9. Respect for continuing learning.

My concept of international education relates to this hierarchy of values. Internationalisation means a strategic, concerted and essential focus on enabling our students and faculty to engage meaningfully and responsibly in genuinely co-operative, trusting dialogue and activities where the cultural differences are understood and respected. Thus, we break through isolationist, insular and parochial mindsets – not just to trade more effectively or to avoid a war or to enhance job prospects – valuable though they may be. Rather, we seek to understand, to appreciate, to integrate and to be with others ordinarily separated by cultural, geographical or language barriers, because we respect them. Trust, sensitivity, responsibility and responsivity are virtues difficult enough to practice within our own culture. But they mark a genuine and purposeful relationship. So although added revenue is an appreciated bonus in our times of fiscal constraint, this is not the reason for being involved. Indeed, because internationalisation is ethically important, we should be willing to sustain a financial loss.

We should encourage our students in their learning, our professors in their teaching, our curriculum designers in their planning and our administrators in their servicing to engage with students and faculty from other cultures, by transcending the barriers imposed by the accidental twists and tricks of history, and by celebrating the rich diversity of perceptions and wisdom each and everyone from other cultures can bring.

Again and again, I have heard teachers affirm that, providing the overseas students can speak the English language satisfactorily and have a measure of self-confidence, they enhance the learning experience of New Zealanders. Their dedication makes them a delight to teach and provides a catalyst for improved work habits and international understanding.

It is crucial in this that we, our students and colleagues, understand our own culture, which I fear is not happening adequately. The more we can appreciate our own culture and understand our own cultural perceptions, the more likely we are to appreciate the culture of others.

One of the most important consequences of internationalised education is the creativity emerging within relationships involving people from substantially different backgrounds. Different perceptions, different orientations and different wisdom can stimulate us to reassess what we do, how we think and what we value. Thus we learn to think more creatively about the meanings of self and society. We begin to see ourselves as integrated within, and responsible for our global community as well as our own society. This is a difficult adjustment for some.

We should examine our curricula to integrate, where appropriate, the internationalising dimension. For example, our nursing graduates should understand the culturally different attitudes to dying and death. Their care must be as sympathetic and as engaged as possible with the culture of each person. They must avoid this syndrome of "cultural dumping".

The study of another language is important to the process of internationalisation. To establish cultural credibility, to nurture respect for another people, to relate meaningfully with them, we need to be able to understand their verbal and non-verbal communications. Unfortunately, because English at present is the major global language, we expect others to be as fluent as we are. But this is cultural arrogance. We should not expect the rest of the world to be internationalised only in the English language because we are too underskilled, or too lazy.

Several years ago, it was recorded that Japan sent 30,000 salespeople to France, all of whom spoke French. On the other hand, France sent 5,000 salespeople to Japan, with only 1,000 speaking Japanese. The internationalisation process was skewed.

A mature values-based internationalisation is not a mindless respect for all the practices of people from other countries. It fails if it degenerates into a wish-washy eclecticism. This quest to be authentic in terms of one's own value system is difficult even within one's own culture. It is much more difficult when a newfound friend, or a student from another culture which is intriguing and fascinating in its uniqueness, propounds a myth or value which differs from our own. But the relationship is less than authentic if we do not respond clearly, with dignity, sensitivity and respect. Somehow, we have the obligation in the search for mutual enlightenment to challenge that myth or value without being judgemental or pretentious or in any way demeaning. Then, at least, we can clarify our own understanding, even if our view is not shared.

It is easier to engage in constructive dialogue with people who are confident in their culture and whose culture is familiar. For example, while being in the USA, I opposed the Vietnam War, and nuclear arms build-up. Critical argument is part of the US culture. But with Pacific Islanders it is more difficult to be so direct. Let me explain. I accept that some Polynesians will walk slightly behind a distinguished guest as a mark of respect and not because they are slow or lazy. I accept that a Polynesian will sit down before being invited to do so because they believe it is impolite to talk to someone unless sitting down. I no longer regard the Polynesians tendency to avoid eye contact in an interview as being closed or untrustworthy, but accept it as a mark of respect. I actively prefer the Polynesian attribute of co-operation in the classroom where students will assist each other to do well rather than compete against each other for higher grades. But my value system does not allow me to accept some Polynesians' refusal to seek employment at a level exceeding the socio-cultural status of the father as a mark of respect. I regard this practice as a recipe for failure and a denial of talent and feel I have the obligation to say so in a respecting, caring and responsible way.

My particular values-based internationalisation requires an ethical stand against some global practices – which may present uncomfortable consequences. For example, a transnational or global company with loyalty only to self-interested profits, with no accountability to national governments or local communities, and with huge wealth and power, can be destabilising for a community and even an entire country. A large industry once ruined a small city in the USA by moving to Korea for cheap and docile labour. Then, it moved to Vietnam for the very same reasons and the very same consequences. Workers were left devastated and the commercial and local infrastructure suffered. Such downsides of globalisation can only be confronted by people with an international consciousness and conscience. More than ever, the phenomenon of globalisation requires that the sense of social responsibility implicit in internationalisation be integrated into the curriculum.

Another dimension requiring us to be authentic relates to quality. Critics judge that educational standards suffer when we internationalise our classrooms. My response is that this deterioration will occur if we merely globalise our classroom, which means enrolling full fee-paying overseas students without the sufficient competency or language skills to learn complex skills and concepts. Some overseas students refuse to accept our requirement to complete an English language programme. We know the costs incurred and the trauma of failure. So we deny ourselves this opportunity to globalise. But we fear they enrol in another institution.

A government contracted us to provide a year-long programme to upgrade twelve teachers. One of them did not perform well. He threatened that if we failed him we would receive no more students from his country because he was related to a key political figure. We failed him and denied ourselves students from that country for a decade. Our educational credibility must not be compromised by our quest to globalise.

I resent universities so hungry for overseas students that they indulge in aggressive and grandiose advertising and lure overseas students by promises of fast tracking them through to advanced degrees. Less than scrupulous recruitment agents who promise that we will secure their clients permanent residency must be rejected.

One day I hope there will be an internationally accepted set of quality standards with an organisation responsible for quality audit. In the meantime, a values-based Code of Practice would usefully constrain the excesses of those who indulge in the quest for the dollar through globalisation.

Being committed to a values based internationalisation requires extreme care in responding to the trauma of culture shock. There are various causes.

- Students previously merely passive recipients of information and examined by multi-choice answers or regurgitated memorised passages move to a system requiring critical analyses which demonstrate complex conceptual understanding. Also, they confront interactive learning experiences where teachers expect students to challenge or question their statements. But questioning the teacher can be regarded as insulting or impertinent. And they lament that their long hours of grinding memorisation fail to yield them the results New Zealand students acquire with creative argument and far less work.
- Students may have mastered the grammar of the English language but struggle with accent, idiomatic expressions, slang and speed of speech. Hours must be spent mechanically and carefully checking out every word of the teacher's presentation. This is debilitating and time consuming, leaving the student unable to summarise the essential meaning of the session. This also makes them diffident about responding to questions in class.

- Overseas students may be disoriented by a false expectation that a teacher will tell them precisely what they should learn to pass the test. Rather, the teacher may challenge them to think outside the box, to think creatively, independently, according to the ideal of transformative education.
- Accommodation difficulties, strange foods, difficult social experiences, financial constraints, loneliness, are difficulties facing all our students. They are compounded for overseas students. Relational networks often are bonded by ethnicity, sporting or hobby interests and old school ties. The outsider, especially if nervous, shy or diffident, commonly finds it difficult to engage. It takes time, energy, charity and generosity of spirit to break through such barriers.
- Faculty experience difficulties also. For example, moving from a decentralised, empowering administrative structure to a centralised controlling system in an exchange programme can be traumatic. And some teachers argue that they have been employed to inspire students to engage in critical thinking about their area of expertise – not to teach students how to read, write, spell and speak English. Their lack of empathy for overseas students relates to their inability to accept a responsibility that transcends their normal duties as teachers. And, frustration results for them when an Asian student answers "yes" to the question: "Do you understand this?" when the student has no idea but wants to agree with the teacher and be polite.

We cannot alter our power structure, or our pedagogy or our social processes to suit the overseas student or faculty member. But we can provide extra orientation to enable them to adjust and feel as comfortable as possible. We can organise group support, providing social experiences and personal assistance, e.g. in finding comfortable accommodation. Care and concern is excellent medicine for any student, but particularly important for foreign students struggling without their familial support.

This requires administrative supervision, organisation and caring engagement. It can be expensive. But, it is the process of internationalisation.

Faculty and students who respond positively to the challenges of internationalisation find a new zest, an extended understanding, and an increased educational satisfaction. Those who prefer to be pre-occupied with their own identity and needs are retreating to the sidelines of history with their educational experience diminished.

In conclusion, I strongly affirm we should respond to the realities and educational challenges and opportunities of the global village but with a strategy based upon a code of values, with a long-term perspective, and with respect for those with whom we co-operate regardless of their social, religious, and political beliefs and practices. Thus, we engage in a process of internationalisation. Thus, we prepare our students to be responsible citizens in the international community.

Accordingly, we will not diminish, alienate or marginalise any of our students. We will not knowingly melt down ethnic differences and meld our students into our culture thereby demeaning their pride in their uniqueness. This commitment to respect the integrity of different cultures is extremely difficult given that the students all want to defer to and succeed in our globalised monocultural society. But, at least, it is our responsibility to respect them for who they are, and provide them with equal opportunities to succeed in their learning aspirations.

Ideally, we will celebrate their cultural uniqueness and engage with them in ways that enable us to both grow in understanding ourselves, our societies and our cultures. It means being sufficiently confident about our own culture and respectful of the other's culture so that we can share meaningfully, honestly and purposefully our experiences and ideas.

In this era of turbulence with changing technologies, systems and structures, our graduates must be able to network, liaise, connect, plan, deal, trade, dispute and communicate with people as partners who are from diverse ethnic, cultural, ideological, geographical and religious backgrounds. It is a complex world where mistakes can be serious and successes exciting. It is a fragile world where a peaceful interdependence is crucial for all of us. It is a world that requires graduates educated into the meaning of international understanding.

TEND 2000

Crossroads of the New Millennium

# From Teacher Dependence To Learner Independence: Case Study From The Dubai Women's College

Prepared and Presented

By

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Workshop 2

# Abstract

In this paper, I discuss the process of changing paradigms in practice - from teaching to learning – or from a traditional teacher-dependent classroom to an independent learning environment. This process requires the transformation of attitudes, beliefs, and actions – for both the learners and the teachers - through understanding, acquiring and applying fundamental independent learning principles, skills and attitudes, as well as overcoming learning and teaching barriers. The acquisition of basic independent learning skills and overcoming barriers to learning are essential in a technologically demanding education system and work environment. Although systemic and personal barriers to implementation exist, research and practice demonstrate that both teachers and learners are able to begin the transformation through constant reflection and self-evaluation in an environment where there is mutual trust between the teacher and individual learner.

To put this process into perspective, this paper begins with an analysis of the concepts of teacher dependence and learner independence and their implications in practice. I then move on to discuss what it takes to make the shift from teacher dependence to learner independence. I use the INDE course (a first-year Certificate Diploma course at Dubai Women's college) as one example of how the educational community can become involved in making this transition a reality.

# From Teacher Dependence to Learner Independence: Case Study from the Dubai Women's College

> It is a tragic fact that most of us only know how to be taught;
> we haven't learned how to learn. Malcolm Knowles.

In the above quote, Malcolm Knowles strikes at the heart of the purpose of education and the meaning of the educated person and focuses our attention on the outcomes of two opposing paradigms of teaching and learning. A teacher-centred educator would define the primary purpose of education as the transmission of knowledge, including skills, understandings, attitudes and values. According to Knowles, the implicit objective of this kind of education is the production of competitive and knowledgeable but dependent people through norm-referred testing and grading (Knowles, 1989: 132). Teachers in a system such as this have full responsibility to decide what is to be learned, how it is to be learned, when it is to be learned and if it has been learned. The learner's role is to receive what the teacher transmits and to do as the teacher tells her.[1]

On the other hand, a learner-centred educational system's purpose is to help people become competent and co-operative, with the highest competence being that of continuous, independent, self-directed and lifelong learning. In this system, teachers are facilitators of learning where learners are independently, creatively, expandingly, and not statically knowledgeable. What sets these learners apart from those who are products of a teacher-dependent system is the ability to avoid becoming obsolete by using their acquired knowledge to continuously anticipate new conditions and make changes accordingly (Ibid: 132). These are qualities that are highly valued and essential for success in a world where changes take place constantly as new and more improved technologies are introduced.

The differences between the two approaches to education are made implicit in their respective epistemological assumptions about the roles and responsibilities of learners, teachers, and education and about knowledge itself. In practice, the change from a teacher dependent environment to one that fosters independent learning becomes dependent on overcoming those assumptions that act as barriers to the transformation.

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[1] I have chosen to refer to students and teachers in the feminine forms: she, her, herself.

## TEACHER-DEPENDENCE

Assumptions about learners, in general, translate into specific roles for them and their teachers. In a traditional teacher dependent setting, these assumptions result in a situation where the teacher has total control of the teaching process and the student has none (figure 1). Not surprisingly, assumptions implicit in a teacher-dependent environment include the following:

- the student cannot be trusted to pursue her own learning
- presentation equals learning
- the aim of education is to accumulate brick upon brick of factual knowledge
- the truth is known
- creative citizens develop from passive learners
- evaluation is education and education is evaluation

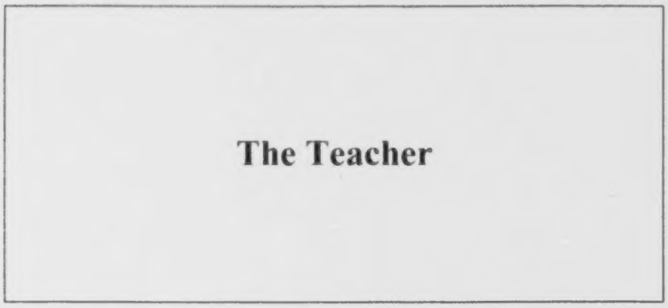

Figure 1. Total Teacher Dependent Environment: The students have no voice here. The teacher is in control. She is the giver of all knowledge and the student is the silent recipient.

This kind of educational setting supports and develops an environment that is not conducive to learning (Freire, 1970). By placing emphasis on the teacher as the giver and the student as the receiver, this teacher-centred view of teaching as the transmission of knowledge is counterproductive to student learning (Sheppard and Gilbert, 1991; and Trigwell et. al., 1994). It further perpetuates the teacher as the only source of knowledge and the student as an empty vessel waiting to be filled with the teacher's knowledge. In an environment like this, teachers teach (often lecture) and students are taught; teachers know everything and students know nothing; teachers think and exclude the participants from the process; teachers discipline and students are disciplined; teachers choose and enforce their choice, and students comply; teachers act while students remain passive; teachers choose the programme content, and students (who were not consulted) adapt to it; and teachers teach to meet their teaching needs which are often not the same as the learning needs of their students (Freire, 1970).

A teacher-dependent system encourages teachers to set expectations for teaching outcomes. In other words, lesson objectives are teacher and not learner centred. As Knowles stated in the opening quote, after years of_being exposed to teacher-dependent mode of schooling, students learn how to be taught and not how to learn. It is inevitable that these students believe the core beliefs of the system and behave in ways that reinforce the earlier mentioned assumptions. Many students thus act passively, want to be taught, do not trust their own knowledge or acknowledge its existence, and instead focus solely on retaining what is 'taught' and passing exams.

## LEARNER INDEPENDENCE

> Independent learners are more likely to have more thought, more mind, more philosophy, more true enlargement than those earnest but ill-used persons, who are forced to load their minds with a score of subjects against an examination, who have too much in their hands to indulge themselves in thinking or investigation, who devour premiss and conclusion together with indiscriminate greediness, who hold whole sciences on faith, and commit demonstrations to memory, and who too often, as might be expected, when their period of education is passed, throw up all they have learned in disgust, having gained nothing really by their anxious labours, except perhaps the habit of application (John Henry Newman, 1852: 238).

A learning environment where learners are independent is in contrast to the traditional teacher-dependent one. Independent learning is characterised by a high degree of learner-control over instructional elements, whether it is in or out of the classroom environment.[2]

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[2] Innovations that have a strong element of promoting independent learning include: Problem-based learning (Barrows and Tamblyn, 1980; Boud and Feletti, 1991) and variations such as 'enquiry and action learning' (Burgess, 1992; Burgess and Jackson, 1990). These

These include the setting of objectives, making choices about pacing, content and methodology, and self-assessment of learning outcomes (Candy, 1991: 13).

Assumptions about independent, self-directed and life-long learners and learning seem to stand in opposition to the teacher-centred ones:

- human beings have a natural potentiality for learning
- significant learning takes place when the subject matter is perceived by the student as relevant to her own purposes
- much significant learning is acquired through doing
- learning is facilitated by students' responsible participation in the learning process
- self-initiated learning involving the whole person – feelings as well as intellect – is the most pervasive and lasting
- creativity in learning is best facilitated when self-criticism and self-evaluation are primary, and evaluation by others is of secondary importance
- the most socially useful thing to learn in the modern world is the process of learning, a continuing openness to experience, and an incorporation into oneself of the process of change (Rogers, 1980: 294 –301; Knowles, 1984: 108; and Knowles, 1989: 54-55).

In essence, the concept of independent learning goes beyond the issue of control. Control cannot be realised in the absence of a learner's ability to conceptualise, design, conduct and evaluate her own learning. An independent learner is someone who is in control of her own learning, because she can make informed choices, act reflectively, take responsibility for the learning process and outcome, and is an active participant in her own learning.

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approaches organise study around key professional problems rather than traditional disciplinary knowledge. With staff support and access to appropriate study materials, students plan their own learning to address problems with which they are confronted; Self-directed learning (Hammond and Collins, 1991), learning contracts (Anderson et al., 1994, forthcoming; Knowles and Associates, 1986; Stephenson and Laycock, 1993) and the negotiated curriculum (eg, Brew, 1993; Millar et al., 1986). The emphasis in these approaches is on negotiation between staff and students about what is to be learned and how it is to be learned. Such negotiation takes place on either an individual or group basis; and Experiential learning (Kolb, 1984; Weil and McGill, 1989), experience-based learning (Higgs, 1988) and action learning (Beaty and McGill, 1992; Pedler, 1991). These approaches place particular emphasis on the past and current experience of learners. They involve either the construction of appropriate learning events and the processing of the experience gained or working with students' experience of events outside the immediate context of the course.

Accomplishing these is not an easy feat. Becoming an effective independent learner takes skill, training, and practice, not to mention opportunities for independent action. It also takes the right frame of mind and attitude, on the institutions', teachers' and learners' behalf. And perhaps most importantly, it takes the belief that, however difficult, it is possible to achieve.

It is important to understand that an independent learner, who practices control over her learning, has some necessary skills to be self-sufficient. Being self-sufficient however does not mean the learning takes place in isolation. Perhaps due to the terminology used – independent – people develop certain misconceptions about the characteristics of an independent learner and the learning process. These misconceptions in turn act as barriers to engaging in a true independent learning venture. One common misconception about independent learning is that it takes place in isolation, and away from the teacher. In other words, this is the only way for the learner to have 'total' control over her learning. The image that comes to mind is the learner, left alone to do the work on her own, receiving no direction, guidance or feedback from anyone else. This image stems from the assumption that a true independent learner does the work herself and is completely responsible for her own learning, for both the process and the outcome of her efforts. She needs no help and gets no help. She must do it all on her own. This gives the teacher an opportunity to take herself out of the picture entirely, absolving herself of any responsibility where the students' learning is concerned (figure 2).

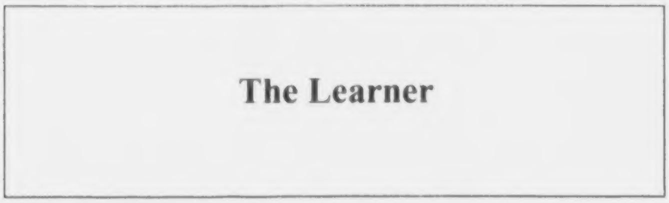

Figure 2. Misconceptions about Independent Learning: All student and no teacher

However, even the 'best' independent learners may at times need help. Reflecting on the learning situation, evaluating it, making decisions about the next step needed to be taken, and planning the course of action also include deciding which resources (including people resources or learning facilitators, such as teachers and librarians) are needed to help the learner achieve her goals. The success of independent learning at times depends on the partnership between the learner and people resources. The learner decides how much input is needed and seeks it as necessary (Figure 3).

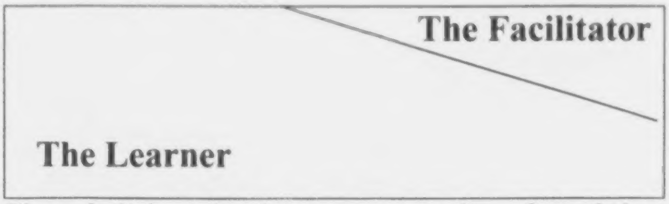

Figure 3. Independent Learners may need to refer to their teacher for help.

Here, diversity of purpose is permitted to exist. Students are learners active in their own learning and teachers are facilitators of learning. The facilitator's job is to set the initial mood or climate of the class and help elicit and clarify the purposes of the individuals in the class as well as the more general purposes of the group. The facilitator then relies upon the desire of each student to implement those purposes that have meaning for her, as the motivational force behind significant learning. She endeavors to organise and make easily available the widest possible range of resources for learning, regards herself as a flexible resource to be utilised by the group, and is able increasingly to become a participant learner, a member of the group, expressing her views as those of one individual only. And, in her functioning as a facilitator of learning, she endeavors to recognise and accept her own limitations (Rogers, 1969: 164-166).

## FROM TEACHER DEPENDENCE TO LEARNER INDEPENDENCE

> I feel certain that given this [independent learning] approach to education, I would indeed be able to survive - even thrive - in a world characterised by an accelerating pace of change (Malcolm Knowles, 1989: 135).

It is evident from the discussion so far that moving from teacher dependence to learner independence requires a total conceptual shift on behalf of the learner, the teacher, and the educational institution. The question that remains to be answered is 'how.' Becoming a successful independent learner takes years of training, practice and experience. Becoming effective facilitators of learning also takes time, effort, and training. To make the transition, there needs to be a shift in our focus from teaching to learning and from teachers to learners.

Teachers need to become facilitators. Instead of teaching, they must facilitate learning. There are no 'teachers' in this system, only resource people.

Resource people require a very different set of skills, attitudes and values from those of traditional classroom teachers, and so a process of retraining of teachers would be required to put the system into operation. Learners too need to be retrained to take responsibility for their own learning and acquire independent learning skills. They cannot remain as passive receivers of information but active acquirers and producers of knowledge. They also need to take control of their own learning. Research indicates that when people perceive the locus of control to reside within themselves, they are more creative and productive (LefCourt, 1976) and that the more they feel their unique potential is being utilised, the greater their achievement (Maslow, 1970). The walls of the classroom need to be erased, making the world itself the place of learning.

Educational planners and administrators also need retraining. In the end, no matter how difficult the journey, one must start somewhere and there is no time better than the present. No age is too old or too young and no place too big or too small. The only things that really stand in the way are people's own self-imposed limitations that are filtered through dispositional barriers.[3]

Barriers can be broken down through systematic planning and implementation. In addition to retraining, teachers can assess students' knowledge, understanding, experience, background, learning attitudes and values, and level of learning ability or skill in planning and carrying out independent learning projects. They can then provide skill development exercises that help the learner move to a higher level of ability in independent learning (Knowles, 1989) while keeping in mind Bloom's Taxonomy of Cognitive Processes.[4]

Teacher-specific barriers can be overcome if teachers believe in their students, offer them challenging opportunities, and involve them in the learning process, i.e., planning, assessing needs, formulating goals, designing lines of action, carrying out activities, and evaluating results. Students need to hear from their teachers that they are capable of accomplishing tasks.[5] They need to feel that as individuals, they have a lot to offer. People perform at a higher level when they are operating on the basis of their unique strengths, talents, interests, and goals than when they are trying to conform to some imposed stereotype (Csikszentmihalyi, 1975; Erikson, 1974; Goldstein and Blackman, 1978; Maslow, 1970: Messick and Associates, 1976; Moustakas, 1974; and Tyler, 1978). Students need to be stimulated and their creativity rewarded. Teachers and learners need to feel that it is all right to experiment and learn to treat failures as opportunities to learn rather than as acts to be punished (Cross, 1976; Ingalls, 1976; and Toffler, 1980). Most of all, teachers need to encourage the students to be independent learners and understand that a universal characteristic of the maturation process is movement from a state of dependency toward states of increasing self-directedness (Baltes, 1978; Gubrium and Buckholdt, 1977; Loevinger, 1976; and Rogers, 1969). Teachers must realise that because of previous conditioning as dependent learners, learners need initial help in learning to be independent learners (Kidd, 1973; Knowles, 1975, 1977, 1980; and Tough, 1979). And to provide this kind of help, they need to develop their skills as facilitators and consultants (Bell, and Nadler, 1985; Blake and Mouton, 1976; Bullmer, 1975; Combs, Avila, and Purkey, 1978; Lippitt and Lippitt, 1978; Laughary and Ripley, 1979; Pollack, 1976; Scholossberg and Troll, 1978; and Knowles, 1989). What the learners need is to be given the opportunity to experience learner independence.

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[3] Other barriers to learning include situational and institutional barriers.

[4] 1. Knowledge, 2. Comprehension, 3. Application, 4. Analysis, 5. Synthesis, and 6. Evaluation.

## INDE: An Example in Practice

> …it is fundamental to higher education that students learn to become independent of their teachers and that they should be placed in circumstances in which they are expected to make decisions about what and how they learn… (Boud, 1995; 27).

The INDE course, short for independent learning, began its life at the Higher Colleges of Technology, Dubai Women's College, in September of 1996. It was designed to complement the year one Certificate Diploma course ENGL 1100, through the reinforcement of grammatical and functional structures contained within the numeracy and literacy context of ENGL 1100. Gradually, INDE became the gateway to libraries and independent learning centres around the college system. It thus became responsible for the delivery of information on the most basic library skills, such as understanding alphabetical and numerical orders and identifying parts of a book, and ILC (Independent Learning Centre) skills, such as using a tape recorder, television and VCR.

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[5] The relationship between positive self-concept and superior performance has been demonstrated in studies of students (Felker, 1974; and Tough, 1979).

Over the years, INDE has developed as a course, focusing progressively on learner independence and moving away from teacher dependence. The shift in INDE has taken place both in its content and mode of delivery. Now more than ever before, INDE comprehensively encompasses the acquisition of independent learning principles and skills. Through INDE activities and its implementation process, students are introduced to the basic but fundamental independent learning skills, such as reflecting, evaluating, decision making, problem solving, goal setting, and finding information.

INDE runs over two terms, each 8 to 9 weeks long. In the first term, INDE is scheduled for three periods (45 minutes) in the ILC. In the second term, it only takes place one period a week.[6] Each INDE class (anywhere from 10 to 25 classes) has a maximum of 20 students and at least one facilitator. The overall objective of the course is to "enable students to develop and improve their skills to become more effective and independent learners."[7] To achieve this overall goal, students work on improving their research, retrieval, time management, organisational, decision-making, problem-solving, reflection and self-evaluation skills, and computer skills.

INDE is unlike students' past experiences of teacher-dependent educational opportunities. In INDE, there are no teachers, only facilitators. No direct teaching takes place in INDE. Students are provided with a number of activities to choose from. There are usually a core number of activities that must be completed by the end of each term. Students can also choose from a set number of elective activities to work on once they have completed the core. Although the core activities are mandatory, the order in which students complete the activities are left to their discretion. Students decide which one of the activities they would like to do and when.

Once they have completed the activity, they are responsible for checking their answers and assigning a mark by using answer keys provided. The process of reflection and self-evaluation is most important in developing independent learners. Self-evaluation means more than students grading their own work; it means involving them in the processes of determining what is good work in any given situation. It requires them to consider what are the characteristics of, for example, a good sentence and to apply this to their own work. Self-evaluation helps enable students to become effective and responsible learners who can continue their education without the intervention of teachers or courses (Boude, 1995: 11).

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[6] This may change to two periods a week in both terms in the near future.

[7] INDE Course Outline 1999-2000

Facilitators are responsible for informing and helping students develop a learner's ability to self-evaluate. They are also responsible for checking activities for which there are no set answer keys. Once a student has chosen an activity to work on, she photocopies it and begins her work. She is also responsible for keeping track of the amount of time she spends on each activity. Each student has a personal folder where she keeps her work for further consultation. All folders are kept in a cabinet in the ILC.

Students have free access to their folders during opening hours of the centre and are free to work on their activities anytime they wish. Facilitators encourage students to work on their activities during their free time. It is left to the student to decide how much time she needs to finish her work and plan her schedule accordingly. It is up to the student to ask questions if she has difficulty understanding what needs to be done. The role of the teacher is to facilitate learning in this environment by making herself available to the students, monitoring their progress, and helping the students learn through discovery.

INDE students are made aware of this process prior to the beginning of the course. They are given a document (Appendix 1) in Arabic and English in which their responsibilities and those of their teachers are clearly outlined. Here, they are told that they are responsible for their own learning and will be treated as adults.

The course then begins with an assessment activity that asks students 6 questions about independent learning. Students are asked to write about what they think is the meaning of independent learning and what skills they would need as independent learners. Answers to the first question range from "helping myself to learn," to "becoming better at thinking and learning," to "solving problems on my own," to "doing your work without depending on others." When asked where they can use their independent learning skills, most answered in the ILC! This misconception – about where independent learning takes place or where its skills can be applied – presents one barrier to the development of our students as independent learners. Through INDE activities, students learn that independent learning takes place everywhere and that its skills can be applied to different situations in and out of the classroom.

In addition to activities on various independent learning skills, students are required to keep a learning diary where they record what they learn in and out of class. This is to reinforce the idea that learning takes place at all times and not only in the classroom, and that a teacher need not be present for learning to take place. This is a difficult concept for students to grasp. Often they mistake 'studying' and 'doing' with learning. For example, when asked, "what did you learn in your English class today," they often reply with an answer that says what they studied in class rather than what they learned from the lesson. When asked, "what did you learn outside your class today," often the space for their answer is left blank. Whenever I have asked my students why they had not written anything there, the reply has been that they had not learned anything outside the class. Many others write about what they did outside the class and see that as what was learned. Here, the role of the facilitator is crucial in making the students understand the differences between learning, studying and doing. Many students understand the distinctions after much practicing and reflecting.

This kind of system so reliant on the efforts, enthusiasm and motivation of students and teachers, takes time to be understood and work effectively. This is especially true for students who know how to be taught but don't know how to learn and teachers who know how to teach but not how to facilitate learning. The first few weeks are difficult and confusing for most. Perhaps it is because for the first time, students have been given the opportunity and freedom to choose, trusted enough to be given answers to their activities, and held responsible for their achievements but not through exams and tests and instead through their active participation in their own learning. Possibly for the same reasons, some teachers also find it difficult to adapt to the way INDE is run. Here, facilitator skills' training for teachers becomes crucial in the success of INDE.

Nevertheless, by the end of the term, most students learn what is expected of them and do their activities systematically, planning as they go and ensuring that all requirements are fulfilled. The teachers too are more comfortable with the process and confident in their ability to facilitate learning.

At the end of the term, students briefly evaluate the course. Two major questions they are asked include 1. Name two things you learned in INDE and 2. Name one thing you think was good about INDE. Answers to the first question range from "learning how to learn on my own" to tangible ones, such as "learning how to use the photocopy machine." The two top answers to question 2 have been "depending on myself" and "being allowed to think for myself."

In the end, INDE is not an easy course for either the students or the teachers. Teachers who are not used to facilitating find it difficult to manage INDE and students who are used to 'being taught' experience difficulty getting used to the process. Although this model of teaching and learning does not comply with all the conditions of independent learning, it does provide the opportunity for students to be placed in circumstances in which they are expected to make decisions about what and how and when they learn.

## CONCLUSION

The greatest conceptual shift which is occurring in recent times in education has been from a perspective which focuses on the teacher and what she does, to a perspective in which student learning is central. Although much current practice has yet to fully reflect this shift, the importance of it is strongly reinforced by research on teaching and learning (Ramsden, 1988). Unless teaching helps improve student learning, it is not worthy of consideration. "It must be replaced by something which does influence learning" (Boud, 1995: 25). INDE is just one example where traditional teaching is replaced by something which does just that. It is a course where learning begins with the learner. Both teachers and students are faced with changing their expectations of and assumptions about teaching and learning. This is a starting point for all to reflect and acknowledge different learning preferences and teaching practices. The differences in attitudes, behaviour, expectations, preferences and abilities between the beginning and the end of the INDE course provide enough incentive for future educational planners to consider the shift from teacher dependence to learner independence.

# APPENDIX 1

## Welcome To INDE 1150/1250

**1. What is INDE?** ***INDE*** *is short for* ***INDEPENDENT LEARNING.*** *In* ***INDE,*** ***you*** *will be* ***'treated as adults.'***

**2. What is INDEPENDENT LEARNING?**

- ***INDEPENDENT LEARNING*** *is something we all do naturally in every day life.*
- ***INDEPENDENT LEARNING*** *is about learning skills that you need to become successful* ***learners, employees,*** *and* ***people.***
- *You need* ***INDEPENDENT LEARNING SKILLS*** *to be* ***good CD1 students.***

**3. What do you learn in INDE?**

- *In* ***INDE,*** ***you learn*** *to:*

- *be* **'responsible'** *for your learning*
- **'ask'** *questions*
- **'keep track'** *of your learning*
- **'plan'** *your learning*
- **'make'** *decisions*
- **'solve'** *problems*
- **'use'** *headphones*
- **'reflect'** *on your learning*
- **'evaluate'** *your learning*
- **'think'** *about what you are learning*
- **'find'** *information by* **'reading'** *newspapers, books, by* **'using'** *the computer...*
- **'manage'** *your time*
- **'use'** *cassette and video tape players;*
- **'use'** *the computer*
- **'use'** *the photocopy machine*

*Your INDE teacher will* ***NOT*** *tell you what to do.* ***You*** *have to* ***decide*** *what to do and your* ***teacher will help you*** *do it.*

***Example:*** *You are a new student at DWC. You need to know about your classes, your teachers, your classmates, where you can find information at DWC, and DWC rules.* ***How do you learn all this information?***

***Answer:*** *You ask questions, you search for answers from many people and in many places like the LRC, you read your timetable and your student handbook, you use the internet...*

**4. What do you do in your INDE course?**

- *You **behave like adults**;*
- *You **buy a photocopy card**;*
- *You **complete** a number of **tasks in 8 weeks**;*
- *You **come to the ILC whenever necessary to complete the tasks**;*
- *You **complete a daily diary** about what you learn in your classes;*
- *You **choose what tasks** to do first, second,…;*
- *You **decide when** to do each task;*
- *You **photocopy** the tasks;*
- *You **check your answers** using answer keys;*
- *You **enter your marks** in your log;*
- *You **ask questions**;*
- *You **keep an up-to-date log** of all the tasks you complete;*
- *You **keep all your work in your INDE file**;*
- *You **keep your file nice and tidy**;*
- *You **keep your INDE file in the INDE filing cabinet** at all times; and*
- *You **tidy around you** after you have finished working on your tasks.*

**5. What will your teacher do?**

- *Your teacher will **be there to help you when you need help**;*
- *Your teacher will **check your file**;*
- *Your teacher will **tell you how you are doing** in your course; and*
- *Your teacher will **give you the final mark**: **pass or fail**.*

**6. How do you pass INDE?**

- *You **come to the ILC on time**;*
- *You **speak English** in INDE;*
- *You **complete all the tasks** in your log before the course ends;*
- *You **complete your own tasks**;*
- *You **do not copy your answers** from each other even if you work in groups;*
- *You **act responsibly and professionally**;*
- *You **do the best you can**;*
- *You **respect your classmates**;*
- *You **respect your teacher**; and*

- You **tidy up after yourself**: push your chair back, put your garbage in the garbage can, put your tasks in your file (completed or not), put away everything you use after you are finished using them (books, dictionaries, INDE materials, cassette tapes, videos, headphones

## REFERENCES

- Anderson et. al., (1994). "Expectations of Quality in the Use of Learning Contracts.", *Capability: The International Journal of Capability in Higher Education.* 1 (1): 22-31.
- Baltes, P., (1978). *Life-Span Development and Behaviour*. New York: Academic Press.
- Barrows, H. S., and Tamblyn, R. M., (1980). *Problem-Based Learning: An Approach to Medical Education*. New York: John Wiley.
- Beaty, L and McGill, I., (1992). *Action Learning: A Practitioners Guide*. London: Kogan Page.
- Bell, C. R. and Nadler, L., (1985). *The Client/Consultant Handbook.* Houston: Gulf Publishing Company.
- Blake, R. R. and Mouton, J. S., (1976). *Consultation*. Reading, Mass.: Addison Wesley.
- Boud, D. and Feletti, G., (1991). *The Challenge of Problem-Based Learning*. London: Kogan Page.
- Boud, David, (1995). *Enhancing Learning Through Self-Assessment.* London: Kogan Page Ltd.
- Brew, 1., (1993). "The Partnership Degree: Idea to Reality.", *Research and Development in Higher Education*. 14: 264-71.
- Bullmer, K., (1975). *The Art of Empathy: A Manual for Improving Interpersonal Perception.* New York: Human Sciences Press.
- Burgess, H., (1992). *Problem-Led Learning for Social Work Education: The Enquiry and Action Learning Approach*. London: Whiting and Birch.
- Burgess, H. and Jackson, S., (1990). "Enquiry and Action Learning: A New Approach to Social Work Education.", *Social Work Education*. 9 (3): 3-19.
- Candy, P. C., (1991). *Self-Direction for Lifelong Learning*. San Francisco: Jossey-Bass.
- Coombs, A.W. et al. (1978). *Helping Relationships: Basic Concepts for the Helping Professions.* Newton, Mass.: Allyn and Bacon.
- Cross, K. P., (1976). *Accent on the Learning*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety*. San Francisco: Jossey-Bass.
- Dennison, B., and Kirk, R., (1990). *Do, Review, Learn, Apply: A Simple Guide to Experiential Learning*, Oxford: Basel Blackwell.
- Erikson, E. H., (1974). *Dimensions of a New Identity*. New York: Norton.

- Felker, D. W., (1974). *Building Positive Self-Concepts.* Minneapolis: Burgess.
- Freire, Paulo, (1970). *Pedagogy of the Oppressed.* New York: Continuum.
- Goldstein, K. M. and Blackman, S., (1978). *Cognitive Style: Five Approaches and Relevant Research.* New York: Wiley-Inter-Science.
- Graves, N. (Editor), (1993). "Learner Managed Learning: Practice, Theory, and Policy", Leeds: *Higher Education for Capability.*
- Gubrium, J. F. and Buckholdt, D. R., (1977). *Toward Maturity: The Social Processing of Human Development.* San Francisco: Jossey-Bass.
- Hammond, M. and Collins, R., (1991). *Self-Directed Learning: Critical Practice.* London: Kogan Page.
- Harris, D., and Bell, C., (1996). *Evaluating and Assessing for Learning.* London: Kogan.
- Higgs, J. (Editor), (1988). "Experience-Based Learning". Sydney. *Australian Consortium on Experiential Education.*
- Ingalls, J. D., (1976). *Human Energy: The Critical Factor for Individuals and Organisations.* Reading, Mass.: Addison-Wesley.
- Kidd, J. R., (1973). *How Adults Learn.* Chicago: Follett.
- Knowles, M., (1975). *Self-Directed Learning: A Guide for Learners and Teachers.* New York: Cambridge Book Company.
- Knowles, M., (1977). *The Adult Education Movement in the United States.* Melbourne, Fla: Crieger.
- Knowles, M., (1980). *The Modern Practice of Adult Education.* New York: Cambridge Book Company.
- Knowles, M., (1984). *Andragogy in Action.* San Francisco: Jossey-Bass.
- Knowles, M., (1989). *The Making of an Adult Educator: An autobiographical Journey.* San Francisco: Jossey-Bass.
- Knowles, M. and Associates, (1986). *Using Learning Contracts.* San Francisco, CA: Jossey-Bass.
- Kolb, D., (1984). *Experiential Learning: Experience as the Source of Learning and Development.* Englewood Cliffs, NJ: Prentice-Hall.
- Laughary, J. W., and Ripley, T. M., (1979). *Helping Others Help Themselves: A Guide to Counselling Skills.* New York: McGraw-Hill.
- LefCourt, H. M., (1976). *Locus of Control: Current Trends in Theory and Research.* New York: Wiley.
- Lippitt, G. and Lippitt, R., (1978). *The Consulting Process in Action.* La Joya, Cal.: University Associates.

- Loevinger, J., (1976). *Ego Development: Conceptions and Theories*. San Francisco: Jossey-Bass.
- Long, D. G., (1990). *Learner Managed Learning: The Key to Life-long Learning and Development*, London: Kogan.
- Maslow, A. H., (1970). *Motivation and Personality*. New York: Harper and Row.
- Messick, S. and Associates, (1976). *Individuality and Learning*. San Francisco: Jossey-Bass.
- Millar et al., (1986). "Curriculum Negotiation in Professional Adult Education.", *Journal of Curriculum Studies*. 18 (4): 429-443.
- Moustakas, C., (1974). *Finding Yourself, Finding Others*. Englewood Cliffs, NJ: Prentice-Hall.
- Newman, John Henry, (1852). *Discourses on the Scope and Nature of University Education*. Dublin: Duffy.
- Pedler, M. J. (Editor), (1991). *Action Learning in Practice*. Aldershot: Gower.
- Pollack, O. (1976). *Human Behaviour and the Helping Professions*. New York: Wiley.
- Rogers, C. R., (1980). *A Way of Being*. Boston: Houghton Mifflin, 1980.
- Rogers, C. R., (1969). *Freedom to Learn*. Westerville, Ohio: Merrill.
- Roundtree, D., (1990). *Teaching Through Self-Instruction: How to Develop Open Learning Materials,* London: Kogan.
- Scholossberg, N.K. and Troll, L., (1978). *Perspectives on Counseling Adults: Issues and Skills*. Monterey, Cal.: Brooks/Cole.
- Sheppard, C. and Gilbert, J., (1991). "Course Design, Teaching Method and Student Epistemology. ", *Higher Education*. 22: 229-249.
- Stephenson, J. and Laycock, M. (editors), (1993). *Using Learning Contracts in Higher Education*. London: Kogan Page.
- Toffler, A., (1980). *The Third Wave*. New York: Banton.
- Tough, A. (1979)., *The Adult's Learning Projects*. Toronto: Institute for Studies in Education.
- Trigwell, K., Prosser, M., and Taylor, P., (1994). "Qualitative Differences in Approaches to Teaching First Year University Science.", *Higher Education*. 27 (1): 75-84.
- Tyler, L., (1978). *Individuality: Human Possibilities and Personal Choice in the Psychological Development of Men and Women*. San Francisco: Jossey-Bass.
- Weil, S. and McGill, I. (editors), (1989). *Making Sense of Experiential Learning: Diversity in Theory and Practice*. Buckingham: Society for Research into Higher Education and Open University Press.

TEND 2000

## Crossroads of the New Millennium

# Getting Connected: Online Learning For The EFL Professional

Prepared and Presented

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# Abstract

Distance Learning is not a new phenomenon; Online Learning, however, is a new and exciting form of distance education. As with all novel ideas, Online Learning has vehement opponents and supporters but—no one denies—this is an inevitable step in university instruction, and many online degree and certificate programmes are currently available. Adversaries of Online Learning suggest that the loss of physical interaction will lead to less learning taking place. Another fear is an increased dropout rate due to the added self-motivation and time-management skills required of this learning method. There is additional concern that inadequate computer/Internet access will render programmes moot. In general, instructors who teach in traditional universities wish education to continue to be traditional. For the EFL professional, however, an online MA TESOL programme negates the arguments discussed and offers additional benefits not found in a traditional university. Unfortunately, for the EFL professional—one of the most relevant candidates for this type of education mode—no such online degree exists.

## Getting Connected: Online Learning for the EFL Professional

Distance Learning, in general, is defined as education which "takes place when a teacher and student(s) are separated by physical distance, and technology (i.e., voice, video, data, and print), often in concert with face-to-face communication, is used to bridge the instructional gap" (Lazo "Overview"). It is not a new idea. For more than a century, Distance Learning has allowed busy professionals, whose schedules prevented them from taking regular classes, to continue their education. For many Americans, independent study is a noble endeavor exemplified by Abraham Lincoln, Thomas Edison, and Henry Ford.

In 1892, Penn State University, through the Rural Free Delivery, "delivered courses and agricultural knowledge to rural families" (*History*). Supposedly, Penn State's system was modeled on extension courses offered even earlier by Oxford and Cambridge Universities. These types of extension courses, still extremely common, entailed long queues at the post office—manila envelopes stuffed with course packets, assignments, responses, homework, etc. Depending on location, it might take as long to receive an initial syllabus as it would to complete a class in a traditional university. A few decades later, in 1917, the University of Wisconsin-Madison took the first steps in designing distance learning by radio (Gooch).

However, it is generally presumed that Distance Learning did not enjoy universal awareness until Britain's Open University opened in 1970. According to the university, in 1997 alone enrollment was greater than 165,000 students, paying 75 million pounds in fees. The British school recently forged an alliance with Western Governors University—a virtual university that offers students access to Online Distance courses provided by a range of institutions based in the United States (Goddard).

There is no question that, for a variety of reasons, Online Distance Learning will be an educational reality. Lifelong learning has become an imperative in today's society. A 1995 study of working adults in 48 US states by the Social and Economic Sciences Research Centre at Washington State University found that "81% of those surveyed think that getting additional education is important for them to be successful. Seventy-two percent think that, given the realities of the lives of working adults, distance education methods offer an important means of meeting their needs for continuing education (Almeda). According to University of California Extension, which opened its "doors" in 1996, students "select online courses because of family obligations, job pressures or travel, physical limitations, or lack of local educational institutions" (Almeda).

Perhaps the earliest online course was developed at The School of Management and Strategic Studies at the Western Behavioural Sciences Institute in La Jolla, California in 1981 (Feenberg). Considering the exponential growth of computer technology since then, one can easily conclude that this was, at best, a difficult venture—fraught with complex computer operations and abysmally slow modems. Yet, according to Andrew Feenberg, a member of the design team that created the programme, "Students and teachers contributed literally hundreds of highly intelligent comments to our computer conferences each month. The quality of these online discussions surpassed anything I have ever been able to stimulate in my face-to-face classrooms." One would suspect, then, that Online Distance Learning would be embraced by educators around the world, additionally seen as a panacea to solve the problem of increasing college enrollments without the comparable growth in classrooms.

In large part, this has not happened. Opponents of Online Distance Learning cite a number of complaints with this new trend in education. The biggest of these is that the loss of physical interaction between professor and classmates will lead to less learning taking place. Another fear is an increased dropout rate due to the added self-motivation and time-management skills required of Online Distance Education. Finally, traditional universities are filled with traditional instructors. According to the Oxford English Dictionary, traditional is defined as "Observant of, *bound by* tradition" (italics added). Thus, novel ideas and programmes are greeted with disrespect, intolerance, and a general dragging-of-feet. Other, less esoteric, concerns include intellectual property rights, taxation, tuition discrepancies, and the lack of computer/Internet access. In general, opponents of Online Distance Learning have adopted the pose succinctly stated by David F. Noble, a history professor at York University in Toronto and one of the leading adversaries of the mode, "It's another step . . . toward the sanctioning of a degraded education system." He refers to the colleges and universities who have heralded in this new method of teaching as "digital diploma mills" (qtd. in Feenberg).

In defense of Online Distance Learning, I will now address each of these complaints. Research comparing distance education to traditional face-to-face instruction indicates that "teaching and studying at a distance can be as effective as traditional instruction, when the method and technologies used are appropriate to the instructional tasks, there is student-to-student interaction, and when there is timely teacher-to-student feedback" (qtd. in Lazo "Overview"). More current research continually yields the same results. In a study done at Southwest Missouri State University using a control group (traditional classroom learning) and an experimental group (online classroom), researchers found no significant difference between the test scores of the two groups. Further, "general observations supported that students in the experimental group had a more positive feeling about their experience than the control group" (Wegner). Conversely, but as satisfying, other research suggest "Achievement on various tests administered by course instructors tends to be higher for distant as opposed to traditional students (qtd. in Lazo "Research"), yet no significant difference in positive attitudes toward course material is apparent between distant and traditional education (qtd. in Lazo "Research")."

Proponents of Online Distance Learning recognise that this mode is not appropriate for everyone; indeed, many students do not possess the self-motivation required for this type of learning. The lack of these characteristics are, in large part, responsible for the higher dropout rates noted in some studies. However, since the focus of this paper is on the ELT professional, whose behaviour, drives, and focus differ quite radically from learners in other disciplines, problems of self-motivation should not be an issue. I will, however, return to this issue when I discuss the MA-TESOL programme.

As to the notion of tradition, I certainly cannot express this better than what Martin Van Buren, governor of New York, wrote in 1829: "The canal system of this country is being threatened by the spread of a new form of transportation known as 'railroads.' As you may well know, railroad carriages are pulled at the enormous speed of 15 miles an hour by engines, which, in addition to endangering life and limb of passengers, roar and snort their way through the countryside. The Almighty certainly never intended that people should travel at such breakneck speed."

According to David Jaffee,

> [Online Classes] for many faculty . . . represents a radical departure from prevailing practice that is incongruous with their understanding of the essential nature of teaching and learning. . . . Within educational organisations the classroom has taken on the status of a sacred institution. The classroom is a physical location, containing a fairly standardised set of props and objects that carry symbolic meaning. The classroom is also a social institution—a value and norm-laden contextual milieu—that assigns role obligations, expectations, and differential status to the human participants. When organisational practices like classroom teaching are deeply institutionalised, and combine both material and symbolic features, they are especially immune to transformation.

While I will not delve into the economic concerns at issue in Online Learning, I would like to address the fear of insufficient computer/Internet access. Thirty years ago there were three computers that could be directly reached through the Internet. As of January, 1999, that number was 43.2 million, and it is expected to increase to 100 million worldwide by 2001 (Hankin 18). Another source (Shrivastava 692) put the number at over 200 million users in 1999. In 1998, electronic commerce accounted for $27.4 billion; it is expected to grow to $978.4 billion by 2003 (Hankin 18). The *1993 Peterson's Distance Learning Guide* listed 93 cyber-colleges, while the 1997 edition counted 762. Obviously the market exists which suggests that access exists. In fact, last year, Jones International University, which has no campus and holds classes only in cyberspace, received accreditation from the North Central Association on Institutions of Higher Education (the same body which accredits the University of Michigan and the University of Chicago). Jones International is a for-profit organisation that would not have gone through the lengthy, rigorous process of accreditation if there were only a few students with computer/Internet access. Obviously, most of this computer access is available in highly developed countries. However, developing countries are leap-frogging into the computer/Internet arena with dazzling speed.

Finally, the opponents of Online Distance Learning have not reasonably looked at the myriad of other benefits this mode offers. Among the benefits noted by research of web-based learning environments in Singapore (Singapore Masterplan for IT in Education—a blueprint for the integration of information technology in education as a strategy to meet the challenges of the 21st century), chief among these boons is that time and distance are no longer an obstacle to learning; that is, it provides a time-of-convenience and place-of-convenience opportunity for student-student contact and student-instructor contact (Teh 398). This is important because, according to the American Association of University Professors (AAUP), nontraditional and returning students now account for the majority of students in higher education (Feenberg). Many of these students work and require course schedules different from the traditional ones to which most full-time faculty are attached ( Feenberg).

Further, "ideas, questions, and individual discoveries are not restricted to the one-hour or two-hour contact time of the standard tutorial session"; using web searches allows students to go beyond traditional library research (on current optic transmission lines, the Library of Congress' entire collection of books could be transmitted in just over five minutes [Hankin 19]); web classes are built by participation, thus fostering teamwork and co-operation; guest experts worldwide can be called upon to assist in the discussions; and, inclusion of literary citations in hypertext can be done quickly (Teh 398).

Additionally, the asynchronous component of Online Learning allows for more thought provoking responses; "some people do not do well in spontaneous spoken interaction, but turn out to have valuable contributions to make in a conversation in which they have time to think about what to say" (qtd. in Rogers). Because physical presence is not necessary, "the ability of those with slight to severe emotional restrictions and debilities—shyness, stuttering, lack of confidence, deafness, immobility, blindness—have the opportunity to interact in a virtual community" (Rogers).

A major component of Web Based Instruction is required student interaction—most classroom curricula do not require this level of intercommunication. In general, online learning communities are learner centred; in contrast, most traditional classrooms are instructor centred. Another benefit is that students can view the lecture as often as necessary—an impossibility in a traditional classroom. Research also definitively illustrates that, both qualitatively and quantitatively, student-instructor communication is enhanced in the Online Learning Environment.

Perhaps most importantly, Online Learning gives students two educations: 1) the particular subject matter, and 2) computer skills that are imperative in this age. The latter should not come as a surprise to anyone; clearly, computer/Internet technology is daily becoming a necessity in our global culture. That a substantial majority of all US colleges and universities require all students to take courses in Information Technology illustrates this awareness. According to Management professor Paul Shrivastava, "The emergence of the digital economy is fundamentally changing the way businesses are organised and managed. Electronic commerce, the Internet, and the World Wide Web (WWW) are the core technologies of the digital economy. They are reshaping the way every business management function is conducted in organisations" (691). His comments, while directed at the specific field of management, are quickly becoming true for every facet of our lives.

The growing number of colleges and universities that currently offer completely online degrees and certifications illustrates the reality of the future in higher education. Unfortunately, one programme seems to have been overlooked—the TESOL/TEFL graduate programme. If this oversight is not remedied soon, the future of the profession will be diminished, and ESL/EFL students will pay the greatest price.

It is first necessary to look at the different types of teaching positions and the different types of teachers vis-a-vis teaching English to non-native speakers. The first chasm is between English as a Second Language (ESL) and English as a Foreign Language (EFL). English language teaching, which occurs in a country where English is the official or most commonly accepted language, is called ESL; whereas, English language teaching, which occurs in a country where English is not the official language, is called EFL. In today's global market, where English is the unofficial lingua franca, both groups are in great demand. However, according to a recent article in the *TESOL Quarterly*, most of the English language learning is occurring in non-English speaking countries. It is estimated, for example, that from 750 million to one and a half billion people worldwide use the English language, and only 300 million of these are native speakers (qtd. in Vandrick 403). For the remainder of this paper, then, I would like to concentrate on the EFL profession.

EFL teachers can be categorised into several groups along a continuum. The first group is comprised of native speakers with no formal background in the teaching position and who have no educational credentials; they are often referred to as "backpackers" who are merely looking for a way to subsidise their desire to live in a foreign culture (this does not mean to suggest that they are all abysmal teachers). A more dedicated group is comprised of those who have completed some sort of certificate programme in teaching English as a foreign language (e.g. RSA, Trinity, Cambridge) and those who have a Bachelor's degree in a field unrelated to English language teaching (i.e. mathematics). Further up the spectrum are those who have a Bachelor's degree in field, often supplemented by a certificate, and Master's degree holders in unrelated fields, sometimes supplemented by a certificate. At the far end of the continuum are teachers with Master's and Ph.D. degrees in field.

| 1. | 2. | 3. | 4. |
|---|---|---|---|
| **"Backpackers"** | **Certificate** | **In-field Bachelor's +/- Certificate** | **In-field Master's** |
| | **Unrelated Bachelor's** | **Unrelated Master's** | **Ph.D.** |

Groups one and two generally work in private language institutes that do not have any accreditation concerns, although the latter group may also teach in public primary and secondary schools. Group four is teaching in universities either in their home country or abroad. However, the profile of group three is the most problematic in terms of job possibilities.

Many of these groups' members are dedicated professionals who truly wish to make a substantial impact on students in their EFL classrooms. Some of them start off in private language institutes or public schools below the tertiary level. Others find college/university positions in economically strapped cultures that cannot afford the salaries of appropriately educated and experienced instructors. In Hungary, for example, where I taught in the English department of a Teacher Training College, one of the three native English speakers in the department held a Master's degree in psychology and had no teaching background. The second native English speaker had a Bachelor's degree in field and several years' of EFL teaching experience—although none at the tertiary level. Although the College's hiring standards demanded higher credentials, and the head of the English department was dedicated to a professional staff, the reality was that there were few qualified applicants for a position which paid approximately $US 200 per month. One might suggest that an instructor who would work for this comparatively low salary surely must be dedicated to the teaching profession. If this is true, it is certainly our obligation to assist these instructors in better preparing them for the college level EFL classroom.

There are other EFL instructors who seek professional development—for personal reasons or to climb the rungs of the teaching ladder and find a, more coveted, college/university position—positions which require a Master's degree in ESOL, Multi-Cultural Education, Second Language Acquisition, Applied Linguistics, or English Language Teaching. These teachers got their feet wet in the classroom and found great personal and professional satisfaction, fell in love with their new culture, and/or decided that the expatriate lifestyle was what they wanted. This group, in terms of real world skills, is already, in many ways, better prepared than MA TESOL holders who have studied in the US but have not, yet, experienced teaching in a foreign culture. "The situations abroad could be shockingly different and much more demanding than what are perceived as ESL or EFL situations in many training programmes in the U.S" (Govardhan 116).

According to a recent TESOL colloquium, panelists discussing EFL classes voiced concerns over "large classes (ranging from 50 to 150), lack of teaching aids, un(der)trained local teachers with low English proficiency, lack of appropriate textbooks and teaching resources, unfamiliar educational bureaucracies, antiquated examination systems, and lack of congruence between the educational ideologies and practices of the visitors and hosts" (Govardhan 116). The purpose of my paper is not to attack the problems with US MA TESOL programmes but, rather, to find a way to effectively train current EFL teachers who have already come face-to-face with the realities mentioned within the colloquium and have successfully adapted to a different teaching environment, but who need to supplement their experience with educational qualifications.

It is certainly true that traditional MA TESOL programmes exist all over the world; the Canadian hogwan (private language institute) teacher in Korea can find an MA programme in a Seoul university. But what if she is not in Seoul but in a small village? What if the classes conflict with her teaching schedule? What can she do if many of the learning aids are in Korean because the programme is geared to non-native English speakers? I believe that an online MA TESOL programme would be a viable, effective solution for her.

I do not wish to suggest that an online programme is appropriate for all, and the issues I am raising are geared to one specific group: native English speakers who are living in a non-English speaking country. Further, I do not think my idea is far-fetched, unreasonable, or unworkable. To support my belief, Newport Asia Pacific University in Japan recently began to offer an MS TESOL degree to be completed, virtually, online (two 4-day sessions in Tokyo are required). The leader of this programme is David Nunan, world-renowned linguist and specialist in the field of TESOL.

As already mentioned, critics of online learning point to several difficulties for students when compared to the traditional, face-to-face classroom. I do not wish to suggest they are wrong in their assessments; rather, these difficulties are the same ones that a classroom teacher needs to learn to overcome. Thus, even theoretical material is enhanced by practical experience in the online environment. Self-motivation, dedication, and the ability to study independently are integral components of successful online learning; likewise, these skills are imperative for successful teaching.

Further, according to a suggested preparatory programme to teach English abroad, a necessary element of an MA TESOL programme should include "units that enhance the teachers' geographical and anthropological literacy and respect for other countries and communities, their cultures, their educational systems, and their conditions and ethics of work, including those that provide the sociocultural flexibility to cope with unfamiliar living and working conditions" (Govardhan 123). Online learning allows for a virtual classroom of students from around the globe who can offer relevant insights into myriad cultures. According to John Bigelow, "The diversity of students in a course can constitute a valuable learning resource, particularly when addressing teambuilding, cultural, international, or equal opportunity topics" (637)

In addition to the in-field professional development available through this medium, other benefits abound. For example, computer and Internet abilities will be developed and enhanced. For future EFL teachers who are studying in an education department of a traditional university, these abilities may not be accumulated. While many academic disciplines require these skills of their students, education majors are still lacking this component. According to a survey prepared by the International Society for Technology in Education, gathered from 416 institutions representing approximately 90,000 graduates per year, teacher education programmes 'should increase teachers' exposure to appropriate education technology if they are to aptly prepare them for today's classroom." Further, the majority of education faculty members "revealed that they do not, in fact, practice or model effective technology use in their classrooms" (*Teacher*).

Alone, these results are shocking when we consider that, according to Cheryl Lemke, "today's students live in a global, knowledge-based age, and they deserve teachers whose practice embraces the best that technology can bring to learning" (qtd. in *Teacher*). When we also consider the vast number of computer/Internet resources available to non-native English language learners, it behooves us to make sure that classroom teachers have the ability to assist their students in accessing these sources. This is not "breaking news"; colleges and universities around the world are increasingly requiring computer skills as a condition of employment.

Let's consider a recent advertisement posted by the Higher Colleges of Technology (HCT), our host for this conference, and see how a candidate who is engaged in an online MA TESOL programme might fare. Minimum requirements included:

1) BA plus TESOL diploma
2) Three years teaching experience (preferably at the tertiary level)
3) CALL (Computer Assisted Language Learning) experience
4) Experience in curriculum development and student assessment.

An analysis of each of these prerequisites will help to compare our candidate, "Ken," with other applicants. Requirements 1 and 2 are often incongruous unless we consider the scenario I mentioned above (see Chart)—Bachelor's degree holders teaching in a country that cannot afford to hire more professionally trained (i.e. graduate degree holders) instructors. With the exception of this situation, it is virtually impossible to possess only a Bachelor's degree and to have the opportunity to teach at the tertiary level (as mentioned before, a motivating factor for enrolling in an MA programme). Requirement 4 is a bit ambiguous; experience in curriculum development and student assessment can be attained at the primary or secondary school level, or even at a private language institute. Requirement 3 illustrates that HCT recognises the importance of the computer medium in the acquisition of English language skills. Based on the huge amount of work and money involved in hosting a conference of this size, it is further clear that HCT promotes and encourages professional development.

Let's now look at "Ken's" background.. He is currently teaching in a college in Ecuador, where his dedication to education and his Bachelor's degree in English earned him a position three years ago. During his tenure, he has participated in committees involved with improving testing validity and reliability and has created several new courses designed to encourage and interest students in learning English. Further, last year he began an online MA TESOL programme. Would HCT be interested in his application and potential as an HCT instructor? I believe so. Not only is his experience and education concurrent with HCT's requirements, but the computer savvy and comfortability he is gaining through online learning will be passed to his students. "Ken" also exemplifies an educator who continues to keep abreast in the field of English Language Teaching and is committed to professional development.

While online MA TESOL programmes are not for everyone, they are remarkably relevant for the dedicated educator seeking a tertiary teaching position. Unfortunately, except for Dr. Nunan's programme, no programmes currently exist. Although the novelty of a new teaching method is frightening and overwhelming, we must remember that classroom instruction—what we now refer to as "traditional" learning—is, itself, a relatively recent form of pedagogy. As this third millenium begins to blossom, we should consider that the common form of learning in the second millenium was through apprenticeship. Yet, classroom learning burgeoned in the last millenium, and virtual classrooms must burgeon in this millenium. According to Dr. Shrivastava, "the important point is to make the commitment to develop online learning not as an experiment of one or two or a few courses, but as a mainstream mode of delivering learning" (693).

## REFERENCES

- Almeda, Mary Beth, (December, 1999). "University of California Extension Online: From Concept to Reality". *JALN [On-line serial]*, 2 (2). 29. http://www.aln.org/alnweb/journal/vol2_issue2/almeda.html
- Benson, Angela, and Elizabeth Wright, (1999). "Pedagogy and Policy in the Age of the Wired Professor". *T H E Journal* 27, pp. 60-66.
- Berger, Natalie S, (1999). "Pioneering Experiences in Distance Learning: Lessons Learned". *Journal of Management Education* 23, pp. 684-91.
- Bigelow, John D., (1999). "The Web as an Organisational Behaviour Learning Medium". *Journal of Management Education* 23 pp. 635-51.
- Clarker, Robyn D., (1999). "Going the Distance", *Black Enterprise* 29 pp. 113-17.
- Feenberg, Andrew, (December 1999). "No Frills in the Virtual Classroom". *AAUP [On-line serial]*, pp.30 <http://www.aaup.org/SO99Feen.htm.>
- Goddard, Alison. "Being as Good as the Best". *THESIS [On-line serial]*, 8. 8 Nov. <http://www.thesis.co.uk/tp/52844/199911>
- Gooch, James, (December 1999). "They Blazed the Trail for Distance Education", *Distance Education Clearinghouse [On-line serial]*. <http://www.uwex.edu/disted/gooch.htm>
- Govardhan, Anam K., Bhaskaran Nayar, and Ravi Sheorey, (1999). "Do US MATESOL Programmes Prepare Students to Teach Abroad?", *TESOL Quarterly* 33 (1999): 114-125.
- Hankin, Joseph N., "The Prospects and Problems of Distance Education", *Executive Speeches* 14 18-22.
- Hiltz, Starr Roxanne. "Impacts of College-Level Courses via Asynchronous Learning Networks: Some Preliminary Results". *JALN [On-line serial]*, 1(2). <http://www.aln.org/alnweb/journal/issue2/hiltz.htm>
- *History of distance education*. <http://www.outreach.psu.edu/DE/history.html>

- Jaffee, David. "Institutionalised Resistance to Asynchronous Learning Networks". *JALN [On-line serial]*, 2(2). (29 Dec. 1999) <http://www.aln.org/alnweb/journal/vol2_issue2/jaffee.htm>
- Lazo, Waleuska L. Distance Education: Overview Articles in Education. np. 2nd, *Distance Education Research. Articles in Education.* np. nd.
- Mendels, Pamela, (27 Dec. 1999). "Online Education Gets a Credibility Boost". *The New York Times on the Web.* <http://www.nytimes.com/lib…ch/99/03/cyber/articles/13learning.html>
- Rogers, Curtis R., (16 Dec. 1999). *The New Community: Web Based Instruction, the Internet, and the Classroom.* <http://www.conterra.com/crr/wbi.html>
- Shrivastava, Paul, (1999). "Management Classes as Online Learning Communities". *Journal of Management Education* 23, pp. 691-703.
- *Teacher Training Institutions are falling behind in the Information Age.* 27 Dec. 1999. <http://www.milkenexchange.org/article.taf>
- Teh, George P. L., (1999). "Assessing Student Perceptions of Internet-Based Online Learning Environments". *International Journal of Instructional Media* 26, pp. 397-403.
- US Department of Education, National Centre for Education Statistics. *Distance Education at Post-secondary Education Institutions: 1997-98.* NCES 2000-013, by Laurie Lewis, Kyle Snow, Elizabeth Farris, Douglas Levin. Bernie Greene, project officer. Washingon, DC: 1999.
- Vandrick, Stephanie and Dorothy Messerschmitt. "ESL in the Academy Today." *Education* 116 (1996): 403-10.
- Wegner, Scott B., Ken C. Holloway, and Edwin M. Garton, (29 Dec. 1999). "The Effects of Internet-Based Instruction on Student Learning". *JALN [On-line serial],* 3(2). <http://www.aln.org/alnweb/journal/Vol3_issue2/Wegner.htm>

TEND 2000

## Crossroads of the New Millennium

# Systems And Strategies At The University Of Technology, Jamaica To Strengthen The Education/Industry Interface

Prepared and Presented

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Workshop 2

# Abstract

Since 1995, when the College of Arts Science and Technology (CAST) became the University of Technology, Jamaica (UTech), the institution has been working to integrate the best features of CAST's polytechnic tradition with the academic and research culture necessary in a university. Central to CAST's success were its partnerships with business and industry: training in all programmes involved the workplace, and the College listened to the needs of employers in designing its programmes.

UTech is in the process of refining and strengthening the Programme Advisory Committee system, the workplace training component of its undergraduate programmes, its linkages with other training institutions (both TVET and tertiary) and like-minded external institutions. To these existing initiatives, UTech is adding the Jamaica Teaching Company Scheme and a Technology Innovation Centre, a business incubator for Jamaica.

However, as the University undergoes this cultural transition, it is faced with myriad challenges: how does the University gain the trust of industry? How does UTech assist the staff it inherited from CAST to make the cultural leap to the University? How can UTech create the kind of environment in which people will want to perform outstandingly? How do the students caught in the transition gain rather than lose in the process?

Using the paper as background, the workshop will address these four questions.

# Systems and Strategies at the University of Technology, Jamaica to Strengthen the Education/Industry Interface

## THE UNIVERSITY OF TECHNOLOGY, JAMAICA (UTECH)

At the apex of the TVET system in the English-speaking Caribbean, the University of Technology, Jamaica (UTech) has emerged from the 37-year-old tradition of the College of Arts Science and Technology (CAST). Building on CAST's polytechnic tradition, UTech is undertaking new initiatives to establish itself as a technical university offering innovative, creative programmes of international quality to both Jamaica and the wider Caribbean.

CAST built an enviable reputation in the region for its ability to provide students with practical skills, which made them immediately valuable in the workplace. UTech has retained CAST's *polytechnic* traditions, but added emphasis on professional qualifications and research in the *university* tradition.

## JAMAICA'S NATIONAL INDUSTRIAL POLICY (NIP)

The vision of the NIP is a government/private sector partnership using science and technology as the engines to stimulate industrial growth and productivity. The improvement in economic growth resulting from this burgeoning industrial sector, according the Policy, will lead to an improved and restructured society. The Policy cannot be achieved without a vibrant education/industry interface.

Central to S&T-driven growth is a well-trained, creative work force supplying the needs of the industrial sector, which, in turn, requires an ongoing dialogue between educational and industry. UTech is a leading voice in this dialogue.

## UTECH'S STRATEGIES AND SYSTEMS TO STRENGTHEN THE EDUCATION/INDUSTRY INTERFACE

The key to the success of the education/industry interface is meaningful dialogue. Traditionally, educators have assumed that their role is to provide knowledge to eager listeners; however, the education/industry interface begins from the assumption that educators must *listen* first. This assumption, combined with a partnership approach, ensures the relevance and quality of UTech's programmes to national development. Illustrations of Itch's strategies are briefly described in the following section.

## THE ROLE OF THE PROGRAMME ADVISORY COMMITTEE

Programme Advisory Committees are among the University's most important sources of up-to-date external information. They ensure the quality and relevance of programmes and instructional methods. Schools rely on their Programme Advisory Committees to contribute to the maintenance of standards and quality by determining employment needs, recommending relevant course/programme content, advising on appropriate qualifications and experience for lecturers, recommending appropriate resources to support the programme delivery, annually reviewing student achievement, ensuring that wider societal and professional interests are reflected in the programme design and content, and helping to obtain on-the-job learning opportunities for students in the programme. The Advisory Committees, therefore, are the leading edge interface with business and industry, ensuring that programmes speak to their manpower needs.

## MEMBERSHIP OF ADVISORY COMMITTEES

Advisory Committee membership includes employers, professionals, representatives of related industry, commerce or professional groups, educators, government and recent graduates of the programme. Recently, aided by the advent of electronic communications, the membership has been expanded to include international members, who may be unable to attend meetings but can comment on broad policy issues. The University's membership on the Committees is ex officio and in a resource capacity.

## INTEGRATING SYSTEMS AND LINKAGES WITH OTHER TVET INSTITUTIONS

There are various other TVET institutions in the country and the region, which feed into the University. These linkages enable students an opportunity to enter UTech programmes.

## COMMUNITY COLLEGE FRANCHISES

UTech offers franchises of the first years of selected programmes through Community Colleges in other parts of the country. The franchise system enables students who are geographically distant from the campus to enrol in UTech programmes delivered close to their homes. Upon successful completion of these early years, the students are guaranteed admission to the programme's upper division at UTech. The quality of programme delivery is monitored by UTech in collaboration with the Office of Curriculum Development and Evaluation. The Academic Board approves the minimum criteria and policies, which govern the operation of franchise programmes.

## HEART/NTA COLLABORATION

The entry level of the TVET system in Jamaica is the Human Employment and Resource Training Trust/National Training Agency (HEART/NTA), which is responsible for the provision of skills training for young people and adults at the NVQ levels 1, 2 and 3.

Because Jamaica aspires to the creation of a seamless TVET system through all levels of technical and vocational training to avoid duplication and waste, UTech and HEART/NTA have been working on establishing formal linkages for students to be able to access UTech programmes. UTech and HEART/NTA have signed a Memorandum of Understanding that will create ladders and bridges between the training programmes offered by the two institutions.

In the summer of 2000, diplomats of HEART/NTA's Teaching Diploma[1] will be able to enter a bridging programme in UTech's School of Technical and Vocational Education to pursue a B. Ed. on a part-time basis. This programme is evidence of the possibility of integrating the TVET system in Jamaica.

## COMMONWEALTH OF LEARNING (COL)/UTECH DIPLOMA IN TVET TEACHER TRAINING BY DISTANCE

In September, 2000, UTech will begin a pilot collaboration with Community Colleges in the Eastern Caribbean to deliver the COL-developed TVET Teacher Training curriculum. UTech will manage this pilot through franchise agreements with participating Colleges. The programme is exciting to UTech for a number of reasons: first, because it will meet regional needs for the development of trained TVET teachers; secondly, because it is strengthening UTech's regional linkages, and thirdly, because it is initiating distance education possibilities at UTech.

## COLLABORATION WITH THE UNIVERSITY OF THE WEST INDIES (UWI)

The University has formed a partnership with UWI to offer a joint Bachelor's Degree in Hospitality and Tourism Management. This partnership with UWI is overseen by the UTech

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[1] Offered at the Vocational Training and Development Institute, which operates as part of the HEART/NTA mandate.

Programme Advisory Committee for Hospitality and Tourism Management and managed by a Steering Committee comprised of senior administrators and academicians from both institutions.

The programme includes foreign languages and management and incorporates required work experience as an integral component.

## INITIATING SUCCESSFUL WORKPLACE AND PRACTICUUM OPPORTUNITIES FOR STUDENTS AND FACULTY MEMBERS

Perhaps the most important structural feature of UTech's programmes is the workplace initiative which is integral to virtually all of its diploma and undergraduate, and graduate[2] degree programmes. At least a year of work experience is required to enter any post-Diploma programme; students have work placements as part of Engineering Diploma and Degree programmes; all Pharmacy and Medical Technology students must undertake clinical internships in order to graduate; Architecture students must have two years' relevant work experience in order to enter the Master's programme; Hospitality and Tourism students must have two summers' work in the industry to graduate.

Ensuring the *quality* of learning experiences in work placements and *equivalency* of the work experiences for students is challenging. Ensuring adequate, appropriate student supervision in the work place is the primary challenge: to address this issue, UTech provides competency-based assessment tools[3] and specialised training to enable workplace supervisors to evaluate the students' progress. Academic faculty also monitor the students (and their supervisors) during the work experience, and are available to assist either students or their supervisors as needed. To enable faculty members to keep their skills and knowledge current, Programme Advisory Board members assist selected academic staff to work in industrial or business settings to be aware of the latest practices.

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[2] Graduate degrees which are earned by taught courses.

[3] In some cases these are still under development.

## THE JAMAICAN TEACHING COMPANY SCHEME (JTCS)

The University's Academic Directors[4] have brought to UTech the Jamaican Teaching Company Scheme (JTCS), an integrated approach to increasing collaboration between the University and the workplace which is advantageous to both and strengthens the linkage between them. The Scheme involves collaborative efforts between academic(s) and student associates on the one hand and a company on the other. The relationship is built on finding a solution to a problem which a company has. The working partnership revolves around the activities of associates, usually graduate students who are interested in an action research approach to a higher degree or qualified employees of the company itself who can be assigned to the problem-solving team. UTech faculty with relevant experience and academic background supervise the associates, who work in the "teaching company" to solve the identified problem. The venue for training is the company, where the faculty member visits regularly to advise on the solution to the problem, assess the associate's progress, and measure the satisfaction of the company with the direction of the project.

UTech is involved in the first implementation of the Jamaican Teaching Company Scheme at J. Wray & Nephew Limited, an ISO-certified Jamaican firm with a 250-year-old production pedigree and international distribution. UTech assembled a multi-disciplinary team from across its faculties which visited the company to listen to the concerns and interests of top management and examine its production and distribution systems. Drawing on the diverse expertise of the UTech team, including the Multi-Media Centre, UTech is proposing an integrated IT system which will enable the company to monitor its operation and distribution efficiency.

## THE TECHNOLOGY INCUBATOR CENTRE

The concept of the Technology Innovation Centre grew out of the University's Entrepreneurial Centre, the original strategy the institution used to strengthen the capability of local small business enterprises and build the education/industry interface. After a decade of providing entrepreneurship skills to students in the institution through the

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[4] The Director of Curriculum Development and Evaluation and the Director of Graduate Studies and Research have adapted the British Teaching Company Scheme to suit Jamaican circumstances.

Entrepreneurship Centre, the University has taken advantage of the growing world-wide realisation that microenterprises and fledgling businesses not only need training in business management skills, but also need a nurturing environment in which to grow at the initial stages of their operation. The University, therefore, applied to the Caribbean Development Bank (CDB) and the Canadian International Development Agency (CIDA) to establish a Technology Innovation Centre (TIC) on the University campus.

The TIC aspires to maximise the potential for success of emerging companies. Providing in its own operations a dynamic model of best practices in successful business operations, the TIC is designed to accelerate the growth and success of entrepreneurial companies through the provision of an array of business support resources and services. Its main goal is to produce successful firms which will "graduate" from the Centre as financially viable, freestanding entities that will create jobs, and commercialise critical new technologies, strengthening the Jamaican economy.

## STRATEGIC ALLIANCES WITH EXTERNAL ORGANISATIONS:

### THE WORLD ASSOCIATION FOR CO-OPERATIVE EDUCATION (WACE)[5]

The interface between UTech and the industrial community in Jamaica has been strengthened significantly through membership in the World Association for Co-operative Education (WACE). WACE is strategic in the field of practice-oriented education, supporting co-operative education programmes in countries around the world. Its members include representatives of businesses, government, professional organisations and higher education institutions. A member of the UTech staff has served on the WACE Executive Board since 1996.

### CARISCIENCE

CARISCIENCE is a UNESCO-sponsored regional network, recently established to promote and channel co-operation, communication and exchange among basic and applied science graduates and R&D programmes in the Caribbean in order to promote and strengthen the application of sciences to economic and social development in the region. Its membership includes leaders from academia, business and industry: both the developers and users of scientific information. The Jamaican representative on the CARISCIENCE Advisory Board is from UTech.

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[5] Further information about WACE and its activities and programmes is available by writing to WACE, 360 Huntington Avenue, Suite 384 CP, Boston MA 02115, USA (tel: 617-373-8885; fax: 617-373-3463; e-mail: pfranks@waceinc.org

## CHALLENGES OF STAFF RECRUITMENT AND UPGRADING IN THE TRANSITION PROCESS

UTech was accorded university status in 1995; its Charter was passed by Parliament in June 1999. Therefore, the transition from College to University is still underway.

The "good news" and "bad news" both have been UTech's inheriting a full staff complement from CAST: on the one hand, academic faculty familiar with the traditions of the College and its work-related focus were in place in all programmes; on the other hand, many of these staff members did not have the academic credentials to teach at the University level. Some staff had been teaching at CAST for more than twenty years: their classroom approach was primarily to dictation of notes for students to regurgitate in examinations – a teacher-centred style of teaching/learning which is antithetical in many cases to experiential learning. The espoused University culture now speaks to producing graduates who can …learn independently, reason clearly, think critically, communicate effectively apply their knowledge and skills to the development and improvement of society, and be adaptable in a rapidly-changing work environment.[6]

To meet this vision of the capability of the UTech graduates, the University has been promoting student-centred learning. The Office of Curriculum Development and Evaluation has been training a cadre of Faculty Coaches in student-centred learning and innovative testing and assessment methods to assist academic staff in adapting to the new University culture.

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[6] *Academic Development Plan 1998-2002*, University of Technology, Jamaica (Kingston: UTech, 1999), pp.20-21.

In addition, those staff members who are without the minimum academic qualifications acceptable for teaching at the University have been given a deadline to acquire the minimum level of academic qualification needed to teach at the University[7].

The University has put teaching quality at the forefront of its institutional objectives; to improve teaching quality, academic staff without teaching credentials are required to enrol in a Post-Diploma programme in instructional methods, conducted by the Faculty of Education and Liberal Studies.. At the same time, those without appropriate academic qualifications are expected to enrol in a Masters level programme relevant to their teaching discipline to upgrade themselves.

To assist the transformation, the University has been attempting to "seed" the Faculties with academic staff who have established reputations. The Office of Graduate Studies and Research has been encouraging Faculties to identify "niche" areas for research, and then recruit staff to support research and graduate work in these niche areas. This strategy is beginning to bear fruit in the School of Engineering and the School of Pharmacy and Health Science. However, the lack of turnover in more established staff is slowing the process.

The transformation from the College culture to the University culture, in teaching, research, quality assurance strategies, publication and service to the larger community, is underway, but it is slow to develop among those who have been in the institution for a long time.

## SUMMARY OF THE UTECH EXPERIENCE

The key issues for UTech in ensuring quality in the interface between the workplace and the university have been the judicious use of Advisory Committees for all programmes, linkages with other TVET institutions and workplaces that have a similar commitment to experiential learning; the creation of successful workplace and practicum experiences for students; the introduction of the Jamaica Teaching Company Scheme; the development of a Technology

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[7] The importance of this upgrading cannot be over-emphasised: the University's programmes will not be accredited, either locally by the University Council of Jamaica or internationally by relevant professional accrediting bodies, if the academic staff do not meet at least the minimum university-level teaching requirement.

Innovation Centre; the interaction with external bodies committed to similar goals and objectives, and the encouragement of faculty upgrading.

The combination of all of these initiatives is leading to the development of UTech as a high calibre internationally recognised technical university.

TEND 2000

## Crossroads of the New Millennium

# Flexible Learning At The Crossroads: Are Our Teachers Ready?

Prepared and Presented

By

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Workshop 2

# Abstract

This paper reflects on managing technological change in teaching and learning, with particular emphasis on staff development. It draws on two national reports in Australia. One report team interviewed senior management in 50% of Australian universities (Wills and Yetton, 1997). The other reviewed 104 nationally funded IT based teaching projects (Alexander et al, 1998). Both make recommendations that have implications for staff development. A number of staff development case studies are described, most practising what they preach by adopting flexible learning techniques in order to teach teachers by example about flexible learning: Project LEAD, Teaching at a Distance, Flexible Delivery web site and videotape, Multimedia Pathways, First Fleet OnLine, NCODE Flexible Learning web site and online workshops, Teleteaching 96, Interactive Proceedings 94. A more extensive version of this paper is published in Wills and Alexander (1999).

## UNIVERSITY MANAGEMENT

In 1996/7 the universities of Wollongong, New South Wales and Melbourne collaborated on a report for the Australian Government titled "Managing the Introduction of Technology in the Delivery and Administration of Higher Education". Their research on twenty Australian universities (ie approximately half of the universities in Australia) charts a substantial shift in the importance of IT in teaching and administration, and in how universities therefore position themselves strategically in the market.

Five years ago, IT was viewed by university management as experimental seeding on the edge of mainstream teaching, and as an expensive, albeit necessary, administrative resource. Now, the Vice-Chancellor of The University of Melbourne talks about 'mainstreaming the digital revolution'. Children of the digital revolution selecting their university of first choice may increasingly not see sandstone and status as sufficient.

The interviews with senior management of the twenty universities revealed five main imperatives for reviewing universities' IT strategies as a basis for competition through differentiation in the 'market place':

- the need to improve the quality of teaching
- the need to reduce costs
- the need to service new but small multiple campuses
- the competition for students and
- the changing profile of the student base (greater numbers of part-time mature students).

These imperatives underpin the current drive by universities towards providing more flexible modes of delivery to students, both in teaching and in administration (Wills and Yetton, 1997).

The report also highlights five factors in which organisations must exhibit a 'tight fit' for the introduction of technology to be successful (MIT90s framework):

- strategy
- structure
- management processes
- roles and skills, and
- technology.

This paper focuses on the roles and skills component of the framework.

## UNIVERSITY TEACHERS

Another recently released report (Alexander and McKenzie, 1998), a study of 104 IT-related government-funded university teaching projects, surveyed those at the chalkface in the implementation of new technologies in teaching in universities. Many of the staff involved in projects incurred a high cost in terms of time, resulting in loss of research and personal time. In some cases this had a negative impact on their opportunities for promotion and tenure. (p.viii)

Projects that in general were not successful in achieving the desired learning outcomes, fit the following profile:

- were overly ambitious in terms of desired outcomes for the budget and time available;
- utilised particular information technologies for their own sake, without sufficient regard for appropriate learning design;
- did not change the assessment of learning to reflect changed learning outcomes;
- failed to recognise the importance of the project's context of implementation and the need to think through and plan for this;
- commenced software development without adequate planning;
- did not have access to adequate technical advice, expertise and support;
- acted on technical advice provided by people lacking in the necessary knowledge and skills to provide such advice, especially in relation to the selection of hardware and software;
- did not have access to adequate relevant expertise (where projects involved significant software or multimedia development);
- had academic team members who felt they could perform all the technical functions, such as programming, graphic design, etc., but were not able to do so;
- had staff on the project team who did not value the different skills required and available for the successful project completion;
- had project teams which were unable to resolve differing opinions;
- had a project development team which did not include a member with responsibility for project management, and which did not foresee the need for project planning and/or documentation;
- had a project leader who, in view of his or her teaching release to develop the project, was allocated an extra administrative load by the Head of Department;

- did not adequately prepare students for participation in learning experiences which they had not encountered before, such as working in groups;
- over-estimated students' willingness to engage in higher level learning activities, especially when they were not related to assessment;
- used resources in the project development for which copyright clearance had not yet been obtained, and could not subsequently be obtained;
- had a project leader who was located in a faculty or school where the Head of Department was not supportive, often because he or she felt the time would be better spent on research, or did not value the project;
- developed a project which was operational on the development computer only, and could not be run on the implementation computers because of inadequate memory, disk space, etc., or because of non-existent CD-ROM drives or for implementation on computers which were expected to become available in the future, but which did not become available;
- conducted evaluation (if at all) only when the project was complete, and discovered that changes were required for which funds were no longer available;
- did not evaluate the project in the anticipated context of use, prior to implementing it;
- conducted limited or poor evaluation of the project because of lack of time and/or budget and/or evaluation expertise.

Although the majority of projects were not implemented beyond the institution in which they were developed, there was also evidence that some projects were not fully implemented within the originating institution. These projects typically ceased to be used when the project leader left the institution, or was allocated a different teaching load. Projects in this category were those which:

- were developed to assist students to learn content which was of interest only to the project leader, and hence was not embedded in the department's normal teaching;
- were developed within departments which did not value scholarship and innovation in teaching;
- had complex implementation requirements, resulting in significant time and risk for the academics choosing to use them. (pp. xi - xiii)

## THE NEED FOR UNIVERSITY TEACHER TRAINING

Among other important recommendations on improving the success of technology-based teaching and learning projects, the report recommends that:

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1. Staff development opportunities be provided in the areas of project management, working effectively in teams, evaluation of IT projects, and legal issues related to IT development, for current and potential project leaders.
2. Staff development opportunities be provided in good practice in teaching.
3. Opportunities be provided for all team members who have developed successful projects to share their experiences and products with others. (p. xv)

The University of Wollongong Academic Staff Development Committee established a working party to prepare a report on staff development for flexible learning. The working party recognised that: "staff development is not only about provision of workshops and seminars but also about provision of information, resources and rewards. Flexible delivery may provide longer term rewards in terms of reducing the burden of time pressures, but it is important that academics who free up that time via innovations in their teaching, do not loose that time by having to take on other teaching commitments. Departments may need to review the way they calculate 'teaching contact hours'. Staff who innovate with alternative modes of delivery should also be rewarded by time release, encouragement to attend flexible delivery conferences and by publicity or other forms of recognition of their achievements in this area. Promotion procedures need to openly take more account of teaching innovations and academics need assistance in preparing Teaching Portfolios which demonstrate their achievements in this area. It also recognised that most staff development must be well-integrated with departmental plans rather than operating in isolation from the funding and support of the innovation." (see full report at http://cedir.uow.edu.au/CEDIR/flexible/staffdev.html)

## ACTION LEARNING AS A STAFF DEVELOPMENT STRATEGY: PROJECT LEAD

An example of a staff development strategy that goes past the traditional workshop strategy is Project LEAD. Funded in 1998 by a government grant, the University of Wollongong is implementing staff development in the team-based processes that underpin successful introduction of flexible learning. The need for skills in management, leadership and team building was highlighted in the Alexander and McKenzie report above. Titled Project LEAD (for Leading and Evaluating Advancements in Delivery), it is an example of Action Learning as a staff development strategy.

## VIRTUAL TEACHER TRAINING

If there is to be a paradigm shift in the way educational institutions deliver education, there will need to be a paradigm shift in staff development - not just personal but also organisational. Delivery should be anywhere, anytime. Staff should be able to put themselves into the learner's shoes and actively experience the learning environments that are advocated for their students. In order to mainstream these experiences for students, they need to be mainstreamed for staff professional development. Only when staff are comfortable with using a variety of delivery methods will they be able to incorporate them successfully in their own teaching.

## VIRTUAL RESOURCES: TEACHING AT A DISTANCE

For example, in 1995 the government provided to the PAGE consortium of Distance Education universities funds for workshops for academic and general staff about designing and delivering education at a distance. Funds were also provided to build resources so that staff could learn at their "own time and their own place". The team decided to construct a hybrid CD: the resources were compiled in web format and pressed onto CDROM. The advantages include:

- multiplatform delivery
- speed of video and audio as the resources are being accessed from CDROM rather than across the internet
- capability to easily update and expand the information by providing external links from the CDROM to real web sites
- a familiar navigation interface ie the web browser (Wills et al, 1997).

In addition to standard web navigation and frames, the team designed a graphical user interface to humanise the interaction with the resources. Beginning with a typical scenario in the Dean's Office (the mission assigned), the academic finds out what they need to know about distance education by setting up meetings with the:

- Education Consultant
- Librarian
- Enrolments and Enquiries Officer
- PAGE Liaison person
- Media Services Manager

as well as chatting with a colleague in the Staff Club.

At the University of Wollongong we have recently developed a similar product which is a web site about Flexible Delivery. Instead of delivering the video and audio aspects by CDROM, we provide a videotape to accompany the site. It is available free to any University of Wollongong teacher.

## VIRTUAL RESOURCES: MULTIMEDIA PATHWAYS

Academics developing educational multimedia and subjects on-line are usually not experienced project managers and lack understanding of the overall development process. Impart, a government funded Co-operative Multimedia Centre in which the University of Wollongong is a shareholder, has collaborated to produce a development methodology, parts of which are freely available on the web as a staff development resource (http://www.impart.com.au/pathindex.html).

## VIRTUAL RESOURCES: FIRST FLEET ONLINE

As a university that offers some of its subjects online, in whole or in part, for students either on- or off-campus, the University of Wollongong recognises that students need opportunities to explore first what it might be like to learn online, before they commit to paying fees for an online university subject. We have designed one free subject, *First Fleet Online*, to provide that experience, not only for the students but also for their teachers who are often somewhat more tentative than the students (http://cedir.uow.edu.au/programmes/FirstFleet). Because the majority of the content is a searchable database, First Fleet OnLine is a model of interactivity, demonstrating that interactivity is more than mere point and click. (Wills, 1994)

## VIRTUAL CONFERENCES - NCODE

A similar example of moving beyond content towards communication is the recent collaboration between universities in NCODE, the National Council on Open and Distance Education. A web site about Flexible Learning was collaboratively developed (http://cedir.uow.edu.au/NCODE). Like the PAGE collaboration described in the section above, its first objective was the provision of information. However it has a second objective to provide opportunities for academics (the "learners") to communicate and discuss at a distance the issues raised by the information in the web site. A series of Virtual Staff Development Workshops are being run nationally to enable academics to experience distance learning at first hand using computer-mediated communication and collaboration, with the web site as the focus.

Evaluation of the online workshops so far indicate that often we teachers do not yet have the discipline to set aside the time for our own professional development. We still seem to find it easier to pack our bags and endure long flights and unfamiliar beds for days away in order to attend an event face to face rather than discipline ourselves to keep our computer desktop free for an afternoon to participate at a distance in a virtual event.

## VIRTUAL CONFERENCES – TELETEACHING 96

A similar story emerged at Teleteaching 96 an international conference attracting about 100 delegates to Australia plus 100 online via videoconference or the internet, depending on the event. Evaluation showed that onsite participants in particular were very uncomfortable with the format. In the interests of practising what we preach as Teleteachers, we threw away the traditional conference format of papers delivered in half hour parallel sessions and instead held seven half day interactive events in an Internet Café set up at the Convention Centre. To accommodate the participation of Australian teachers after school hours and international sites across numerous time zones, we held the videoconferences in the evenings however onsite delegates chose not to attend because understandably they preferred to go out to dinner and socialise. And conversely, the virtual conference's social event, a webcast of a rock band who received requests live via email from their worldwide audience, failed to get onsite delegates rocking and dancing because it was held at 10am in the morning and served coffee rather than the alcohol which often helps social events in Australia swing (Lefoe et al).

Everything in the Land Downunder was turned upside down and participants had no familiar formula to fall back on. We have a lot to learn yet about how to make virtual spaces effective. That's not to say all physical spaces are always effective – the traditional mode of delivery in universities and conferences is not very effective yet we stick with it because it's familiar and everyone's role is well defined over centuries of use. Virtual spaces need the same sort of refining and polishing and we as teachers must certainly put OURSELVES in the learners shoes BEFORE we inflict these new developments on our students. We must become flexible about flexible learning.

## REFERENCES

- Alexander, S. and McKenzie, J., (1998). *An Evaluation of Information Technology Projects for University Learning*, Department of Employment, Education, Training and Youth Affairs, AGPS: Canberra.

- Lefoe, G., Corderoy, R. M., Wills, S., (1996). "How Well Do We Practice What We Preach? An Evaluation of Teleteaching '96" in Wills, S, Fritze, P and Cavallari, B (eds) *Practising What We Preach, proceedings of Teleteaching 96*, Australian Computer Society, 1996
- Wills, S., (1994). "Beyond Browsing: Making Interactive Multimedia Interactive" in *Rethinking the Role of Technology in Education*, Educational Technology Conference 1994, Singapore, May, pp. 58-68
- Wills, S. and Alexander, S., (1999). "Managing Technological Change and University Teaching" in Evans, T. and Nation, D. (eds) *Changing University Teaching: reflections on creating educational technologies* Kogan Page, December, pp. 56-72
- Wills, S., Nouwens, F., Dixon, S., and Lefoe, G., (1997). "Teaching at a Distance about Teaching at a Distance" in Kevill, R., Oliver, R., Phillips, R. (eds) *Ascilite '97 What Works and Why*, 14th Annual Conference of ASCILITE, Perth W.A, Curtin University of Technology Printing Services, pp. 628 - 635
- Wills, S. and Yetton, P., (1997). "Strategy and Information Technology" in *Managing the Introduction of Technology in the Delivery and Administration of Higher Education*, Department of Employment, Education, Training and Youth Affairs, Evaluations and Investigations Programme, AGPS: Canberra

TEND 2000

Crossroads of the New Millennium

# Learning Organisations For A Knowledge Economy: The Role Of National Technological Institutes Of Higher Education In The 21st Century

Prepared and Presented

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Workshop 1

# Abstract

This paper has three major arguments. We are in the midst of fundamental changes to our international civilisation. These changes are being enabled by the revolution in information and communication technology. National institutions and education systems are being challenged to mediate, facilitate and moderate the impact of these changes. It can be tentatively concluded that national technological institutes of higher education can help nation states reposition in the global economy, and help develop new forms of governance and international relationships. The caveat is that they will only be able to do this if they themselves become learning organisations, and constantly develop new internal organisational structures and external relationships as their purposes and roles change in the 21st Century.

# Learning Organisations for a Knowledge Economy: The Role of National Technological Institutes of Higher Education in the 21st Century

When the themes of this conference were announced, I was immediately impressed by their strategic implications. Having been involved for decades in professional and organisational development, I felt it important to review primary purposes and organisational forms in higher education, and to predict changes to national institutes of technology given the impact of information and communication technology.

I looked at how the leading universities of the 21st Century are repositioning and reorganising themselves to achieve changing purposes. This meant considering their research strategies, how they intend to develop new curricula and delivery structures and make use of teaching and learning technologies. When I related probable organisational assumptions to the already evident impact of information and communication technology, it became clear that national institutes of technology will have a special role to play - to help their nations to make the transition towards a knowledge economy.

When I contrasted knowledge-driven economies with industrial, agrarian or extractive economies, it became clear how wealth is increasingly being created from new raw materials and production processes. This also helped explained the booming demand for educated 'knowledge workers' and why nation states must actively manage the transition processes. And a key international transition strategy is to have higher education institutes of technology play a strong role in developing advanced knowledge industries.

The next task was to clarify how institutes of technology might be repositioned and reorganised to successfully discharge such a role. Appropriate research, teaching, curriculum, and structural strategies had to be identified, along with effective governance, management and evaluation processes.

To reiterate, this paper has three major arguments and a conditional conclusion. We are in the midst of fundamental changes to the international structures of our current civilisation. These changes are being enabled by the nature of information and communication technology and being driven by economic globalisation. National institutions and systems are being challenged to mediate, facilitate and moderate the impact of these changes so that nation states can reposition themselves in the global economy, and help develop new forms of governance and international relationships.

The caveat is that they will only be able to do this if they themselves become learning organisations, and constantly develop new internal organisational structures and external relationships.

Two phrases require careful definition at this point; 'knowledge economy' and 'learning organisation.' Throughout this paper the phrase 'knowledge economy' is used rather than 'information economy'. When data is organised for specific use, it becomes information. When the quality of information is also provisionally guaranteed for particular purposes, it becomes knowledge. When the conditional nature of knowledge is known with some certainty, along with a sophisticated appreciation of its relativity and the consequences of its circumstantial use, it becomes wisdom. Since business enterprises and governments tend to rely on reasonably trustworthy and economically-critical 'facts', and yet tend to give less consideration to ethically-, politically- and socially-critical dimensions, then term 'knowledge economy' is probably more appropriate than 'information economy' or 'wisdom economy'.

A 'learning organisation' has been defined[1] as one that learns through the convergence of personal mastery, mental models, building shared vision, team learning, and system thinking. Personal mastery is held to be the "discipline of continually clarifying and deepening our personal vision, of refocussing our energies, of developing patience, and of seeing reality objectively ... it is the essential cornerstone of the learning organisation - the learning organisation's spiritual foundation." (p.7) Similarly, "working with mental models starts with turning the mirror inward; learning to unearth our internal pictures of the world, to bring them to the surface and hold them rigorously to scrutiny." (p. 9).

An effective vision binds people together in shared enterprise, and provides principles and goals or aims that guide practices. It gives meaning to commitment, legitimates action and acts as the moral glue for accountability. "When there is a genuine vision (as opposed to the all-too-familiar 'vision statement'), people excel and learn, not because they are told to, but because they want to." (p. 9). Hence, team learning begins when members meet, share assumptions, make all ideas group property, and then, together, select the combination that cohere best as a vision, goals, strategies and objectives. "Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organisations." (p. 10)

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[1] Senge, P. (1990) *The fifth discipline: The art and practice of the learning organisation*, New York: Doubleday.

Finally, the 'fifth discipline' of "systems thinking makes understandable the subtlest aspect of the learning organisation - the way individuals perceive themselves and the world. At the heart of the learning organisation is a shift of mind - from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something 'out there', to seeing how our actions create the problems we experience. A learning organisation is a place where people are continually discovering how they create their reality. And how they can change it." (p. 13)

## THE NATURE OF 20TH CENTURY UNIVERSITIES

Current evidence[2] suggests that universities are being both internally reorganised and externally incorporated in global networks, especially to deliver services in partnerships with giant multi-national communications companies. Leading international research universities are already networking their pure or "blue skies" research. This activity, and associated curriculum development, is driven by academic staff motivated to create fresh knowledge and international research reputations. The leaders of their universities are planning to capture new global markets. Curricula are being developed around the emergent constructs of disciplines and being promoted using global branding.

At the same time, academic structures are being reinforced to deliver degree and postgraduate level study, preserve standards and reward mastery. Students continue to be expected to acquire and demonstrate cognitive understanding in international contexts. In sum, university globalisation strategies are being enabled by information and communication technology while continuing to rely on traditional research, teaching and curricular structures. Two examples illustrate these strategies.

Britain's Open University[3] is now 30 years old and regarded internationally as highly successful. When I completed my BA in mathematics and management in 1976 with the OU, it was five years old and had about 50,000 students. Today it has over 165,000 students and an annual income of over £200 million.

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[2] Oblinger, D.G. and Katz, R.N. (Eds.) (1999) *Renewing administration: Preparing colleges and universities for the 21$^{st}$ century*, Bolton, Mass.: Anker.

[3] Goddard, A. (1999) Being as good as the best, *Times Higher Education*, 5 November, p. 6.

Despite this 'runaway success' the OU is planning massive expansion, both at home and abroad. At home it is planning to offer vocational sub-degree courses called 'associate degrees', lifelong learning opportunities over the web, and a foundation degree in medicine. Abroad it is developing partnerships with a range of real and virtual institutions, and national systems of higher education. In essence the Open University is diversifying at home and exploiting its brand value globally. Many of its strategies are being emulated.

*Universitas 21* is a more recent global network of 18 comprehensive and research intensive universities. It plans to exploit collective brand values, market student places internationally, and increasingly deliver learning by the web.[4] It is currently consulting with additional potential members, considering more formal form of incorporation, and discussing a partnership with Rupert Murdoch's giant telecommunications multi-national company, News Corporation.[5]

There are a number of implications in these and many other examples. These globalisation strategies are primarily enabled by emergent information and communication technologies. They will, nevertheless, continue to build on the old; the research and teaching interests of academic staff, the disciplines and structures of academic culture, and the tradition in universities of stressing cognitive understanding rather than vocational application.

There are three relatively new aspects: global branding and marketing, international curricula valued in knowledge economies, and web-based teaching and learning. And as they diversify their funding sources internationally, universities are becoming less subject to the governance of nation states. This growing ambiguity in university sovereignty is symptomatic of growing concerns about the laissez faire nature of the global economy.

Before discussing the transformative potential of information and communication technology, it should be noted that higher education institutions vary quite markedly in their capacity to govern and manage change. It is also clear that higher education institutions and systems have both diversified and provided for mass access in recent decades. This has led to institutional responsiveness in many settings, and been achieved through internal differentiation and expansion.

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[4] http://www.universitas.edu.au/index.html

[5] Maslen, G. (1999) Moguls court U21,*Times Higher Education*, 19 November, p.6.

In other settings reforms have followed authoritative advice[6] and been managed by system responsiveness, and achieved through nationally co-ordinated differentiation between institutions and by establishing new national institutions. Germany and Italy, for example, have significantly expanded existing universities while establishing new universities in recent years.[7]

This paper does not arbitrate the relative benefits and limits of institutional versus systemic responsiveness but simply acknowledges that both institutions' and systems' capacities to adapt, respond, compete and innovate vary widely.

## THE TRANSFORMATIVE EFFECTS OF INFORMATION AND COMMUNICATION TECHNOLOGY

Historically, radical technological advances have always fundamentally affected trade, redistributed power, altered geopolitical processes and changed the nature of organisations.[8] There are many examples available. I will draw on two.

The first industrial revolution in England 200 years ago triggered demands from frightened people who had been suddenly exposed to laissez faire business rules. They demanded more democratic forms of government. They wanted governments that would shape and moderate the effects of technological change. They insisted on more people being able to elect representatives. They called for curbs on the power of capital, greater legal protection of personal, communal and property rights, and national systems of education to codify and share intellectual capital.

In effect, the first industrial revolution created a power vacuum that was gradually filled by new national polities, national policymaking, and state organisations that implemented policies for the common good, for the common wealth.

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[6] Kerr, C., Grade, M.L. and Kawaoka, M. (1994) *Higher education cannot escape history: Issues for the 21st century,* Albay, NY.: SUNY Press, and Halsey, A.H. (1995) *Decline of donnish domminion: The British academic professions in the 21st century,* Oxford: Clarendon Press.

[7] Gellert, C. (Ed.) (1999) *Innovation and adaptation in higher education: The changing condition of advanced teaching and learning in Europe,* Gateshead, UK, Athanaeum Press.

[8] Woodward, J. (1958) *Management and technology,* London: Her Majesty's Stationery Office.

Today, information and communication technologies are being used to globalise trade but they are creating another power vacuum. In Seattle last December, at the World Trade Organisation meeting, we heard demands from interest groups and nations frightened by the laissez faire nature of economic globalisation.[9] They want proper representation in international bodies, like the G7 and the WTO, curbs on the powers of multi-national companies and large trading nations, debt retirement, and far better protection of small economies and the environment. And while these political dynamics were enabled by the web, they are yet to be structured and legitimated with formal authority. It is also clear from the way the Mafia is using the internet that new international polities and operational rules for commerce are required.[10]

In sum, the information and communications technological revolution has created a power vacuum that now requires the creation of new international polities and systems, and international organisations to codify and distribute intellectual capital for the common good. An early step towards providing intellectual capital for the international common wealth is to develop understandings of knowledge economies.

## THE NATURE OF AN ADVANCED KNOWLEDGE ECONOMY

In essence, an advanced knowledge economy exists wherever the production and exploitation of knowledge dominates the creation of wealth. Highly successful knowledge economies are seen in countries where transitions from industrial, agrarian and extractive bases have been most successfully managed. The crucial implication for institutes is that providing advanced technological education is increasingly recognised as a highly effective national transition management strategy.

To elaborate, intellectual capital or knowledge is the primary resource of advanced information economies. Knowledge is created and developed by four forms of scholarship; discovery, integration, application and teaching.[11] High quality scholarship is typically indicated by the presence of clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique.[12] And, when the creation of wealth in a nation is primarily driven by quality scholarship combined with business enterprise, including e-business,[13] it has an advanced knowledge economy.

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[9] Elliot, L. (1999) Unless the World Trade Organisation cleans up its act there will be more issues for the protesters to trade on, *Guardian Weekly*, December 9-15, p. 12.

[10] Carroll, R. and Atkinson, D. (1999) Mafia money vanishes into cyber space, *Guardian Weekly*, 16-22 December, p. 5.

[11] Boyer, E.L. (1990) *Scholarship Reconsidered: Priorities of the Professoriate*, San Francisco, Calif.: Jossey-Bass.

Advanced knowledge economies work in unique ways. The raw materials of industrial economies include minerals, energy, finance and skilled labour. Agrarian economies depend heavily on agricultural products. Extractive economies rely heavily on energy and mineral sources. Knowledge economies, however, use data, information, images, symbols and culture as raw materials. Educated people then use computers to manipulate these raw materials to develop and deliver valued products and services. This helps explain why many multinational companies and governments now share the assumption that demand for the education and re-education of 'knowledge workers' is growing in ways that will transform education into a boom industry in the global economy.

This is why advanced technological education is increasingly recognised internationally as a key strategy for promoting and successfully achieving the transition to a knowledge economy. In the next section I argue that this will be achieved providing technological institutions adopt a role carefully differentiated from that of research universities.

## THE POTENTIAL ROLE OF TECHNOLOGICAL HIGHER EDUCATION INSTITUTES

The development of sustainable and advanced knowledge industries requires special services from higher education institutes of technology.[14] The nature of these services can also help these institutions specialise, differentiate and market internationally to their competitive advantage.

First, instead of participating primarily in pure or "blue skies" competitive research, institutes of technology should advance knowledge through collaborative and interdisciplinary scholarship, including discovery research. And to accelerate national capacity building, such activity should systematically involve post graduate students.

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[12] Glassick, C.E., Huber, M.T. and Maeroff, G.I (1997) *Scholarship Assessed: Evaluation of the Professoriate*, San Francisco, Calif.: Jossey-Bass.

[13] Clague, M.C. (1999) Understanding e-business. In D.G. Oblinger and R.N. Katz, (Eds.) *Renewing administration: Preparing colleges and universities for the $21^{st}$ century*, Bolton, Mass.: Anker, pp. 45-61.

[14] The argument in this section draws in part on recent policy research reported in Brooks, D. (1999) The Auckland Institute of Technology in transition, unpublished EdD thesis, Charles Sturt University.

Second, instead of building on the fame of researchers, institutes of technology should build the institution's international reputation for scholarship. This would mean giving parity of esteem to all four forms of scholarship and driving up their quality using a range of mechanisms. An example of such a mechanism is to reconstruct the nature of academic staff development mindful of seven challenges: [15]

i. widespread availability of computer-based access to information,
ii. increasing diversity in the student body,
iii. the demand to learn off-campus,
iv. the need to accredit prior learning,
v. the need to build generic or personal transferable skills into courses,
vi. the move towards strategic alliances beyond the university, and,
vii. changing career paths for academic staff.

Third, instead of allowing curricula to evolve as a byproduct of disciplinary research, institutes of technology should develop curricula around graduate profiles defined by national policies, industry needs and advice from the professions. This will require formal institutional commitment to consultations and action research processes.

Fourth, rather than funding "blue skies" research driven by academic interests, institutes of technology should encourage research into pure *and* strategic *and* applied *and* professional challenges that are evident in the international context. Again, this will require sustained involvement of user advisory groups and systematic institutional policy research.

Fifth, rather than use traditional structures to govern access to advanced knowledge, institutes of technology should deliberately provide multiple entry and exit points to vocational and professional preparation. They could also consider developing wider inter-institutional linkages, as in the United States. They often include programmatic, academic and professional links governed variously by formally and legally based policies, state systems policies, voluntary agreements between institutions, and agreements about vocational-technical credit transfer.[16]

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[15] Candy, P. (1997) Some issues impacting on university teaching and learning: Implications for academic directors. In S. Armstrong, G. Thompson and S. Brown (Eds.) *Facing up to radical changes in universities and colleges*, London, UK.: Kogan Page/ SEDA, pp. 170-177.

[16] Kintzer, F.C. and Wattenberger, J.L. (1985) *The articulation/ transfer phenomenon: Patterns and directions*, Washington, DC: AACU, ED 275 539.

Sixth, and finally, institutes of technology should promote technological capacities, including knowledge, skills and attitudes, as being as important as cognitive understandings. Overall, given the potential scale of these six aspects of reform, many institutes of technology will need to be repositioned and reorganised.

## RE-POSITIONING AND REORGANISING NATIONAL INSTITUTES OF TECHNOLOGY

It will not be possible for national institutes of technology to sustain the provision of relevant services if they themselves are not regularly repositioned by effective governance, and deliberately reorganised through effective management and evaluation. My concluding advice follows.

*Repositioning* will involve the processes of reviewing and revising the fundamental purposes of national institutions or systems, and in particular, revising their appreciation of their national and international context, and appropriate development strategies. Governors of national institutions and systems will have to reconcile urgent international trends and opportunities with changing conceptions of national interests, and provide clear policies and effective leadership.

*Reorganising* will involve adjusting organisational structures and service delivery arrangements to respond to both fresh challenges in the workplace and understandings about pedagogy. This will mean applying emergent knowledge of two different realms; economies in transition, and how students and staff learn in open, asynchronous and flexible environments.

System and institutional managers will face complex challenges. The first point is that the situation is just too complex for any CEO or system manager to fully comprehend, control or be solely responsible for. They need the support and guidance of highly expert and representative governors, clear policy making processes and expert executive support staff.

Conversely, CEOs and system managers need to reciprocate by providing philosophical clarity, strategic analyses and political services to governors, institutional middle managers and colleagues. And as understandings of policy develop, CEOs and middle managers will need to mobilise and monitor change using cultural, managerial and evaluation processes.

In sum, CEOs and system and middle managers will have to serve as educative leaders in order to create and sustain the radical degrees of professional development and organisational learning required. Such educative leadership[17] boosts organisation learning through coherent philosophical, strategic, political, cultural, managerial and evaluation activity.

## TENTATIVE CONCLUSIONS

This paper offered three main arguments:

- We are in the midst of fundamental changes to our international civilisation.
- These changes are being enabled by the nature of information and communication technology.
- National technology institutions and systems can mediate, facilitate and moderate the impact of these changes.

It also reached a conditional conclusion:

- National technological institutes of higher education can help nation states reposition in the global economy, providing they become learning organisations.
- Finally, these arguments and conclusion are interim answers to four questions that deserve further debate. These questions will also bear revisiting:
- How is information and communication technology affecting nations?
- What are the characteristics of an advanced knowledge economy?
- What roles are technological higher education institutes playing in the development of advanced information economies?
- How are national institutes of technology being repositioned and reorganised?

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[17] Duignan, P.A. and Macpherson, R.J.S. (Eds.) (1992) *Educative Leadership: A Practical Theory for New Educational Administrators and Managers*, Basingstoke: Falmer.

TEND 2000

## Crossroads of the New Millennium

# Distributed Cognition And Systems For Supporting Social Interaction

Prepared and Presented

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## Poster Presentation

# Abstract

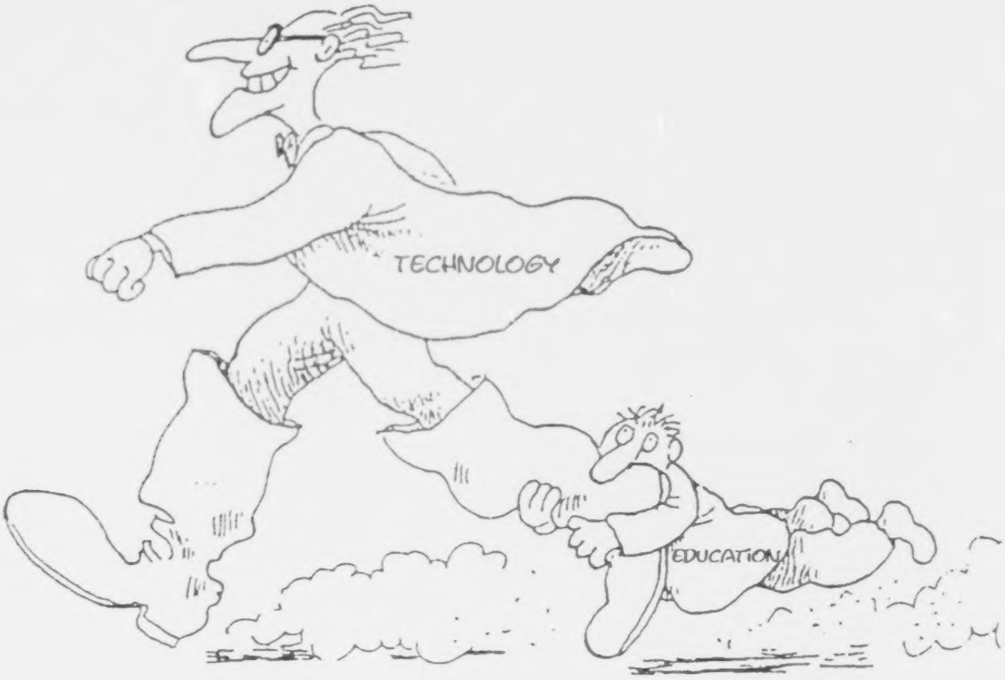
Based on the fact that the individual human mind is limited, conceptual frameworks and innovative systems in support of social interaction are a necessity rather than a luxury for our future information society. Conceptual frameworks need to be grounded in distributed cognition. Because "a group has no head," collaboratively constructed and evolved information repositories are of critical importance to support shared understanding, negotiation, critiquing, and organisational learning. Derived from this conceptual framework, requirements for computational environments supporting social interactions are described. Specific environments (e.g., domain-oriented design environments, organisational memories) illustrate the challenges of creating open, evolvable systems and of contextualising information. The implications for social interaction (such as the need to allow users to be designers and active contributors, the importance of understanding the social and motivational issues, and the new conceptualisations of the World Wide Web) are derived from the conceptual framework and the systems.

## Distributed Cognition and Systems for Supporting Social Interaction

Learning needs to be examined throughout one's lifespan because the traditional notion of a divided lifetime — education followed by work — is no longer tenable [Gardner, 1991]. Professional activity has become so knowledge-intensive and fluid in content that learning has become an integral and irremovable part of work activities. Learning is a new form of labour, and working often is (and needs to be) a collaborative effort among colleagues and peers. In the emerging information society, an educated person will be someone who is willing and able to consider learning as a lifelong process. More and more knowledge, especially advanced knowledge, is acquired well past the age of formal schooling, and in many situations through educational processes that do not centre on traditional schools [Illich, 1971].

Lifelong learning has emerged as one of the major challenges for the worldwide knowledge society of the future. A variety of recent events supports this claim: (1) 1996 was the "European Year of Lifelong Learning," (2) UNESCO has included "Lifetime Education" as one of the key issues in its planning, and (3) the G7/G8 countries have named "Lifelong Learning" as a main strategy in the fight against unemployment. Despite this great interest, there are very few encompassing efforts to tackle the problem in a coherent way. Lifelong learning is comprehensive; it cannot be investigated in isolation by looking just at individual parts of it, such as K-12 education, university education, or at worker re-education.

Lifelong learning is more than adult education that is often only restricted to providing people with minimal opportunities in school-like learning settings during their adult life. The challenge for lifelong learning is to fundamentally rethink learning, teaching, and education for the information age in an attempt to change mindsets [Fischer, 1999a]. It involves and engages learners of all ages in acquiring and applying knowledge and skills in the context of authentic, self-directed problems, and it exploits the possibilities offered by new media. In the future, learning and working should take place, in most cases, as a *collaborative effort* among teachers, learners, peers, and colleagues.



## BEYOND INDIVIDUAL HUMAN MINDS

**The Limitation of the Unaided, Individual Human Mind.** The power of the unaided, individual mind is highly overrated because without the use of external aids, memory, thought, and reasoning are all constrained [Norman, 1993]. As illustrated in Figure 1, the basic capabilities of the unaided, individual human mind has changed little over time. For the design of cognitive artifacts, it is important to know these basic capabilities; some of them, such as working memory, long-term memory, perceptual processors, cognitive processors, and motor processor and their basic characteristics are described [Card et al., 1983].

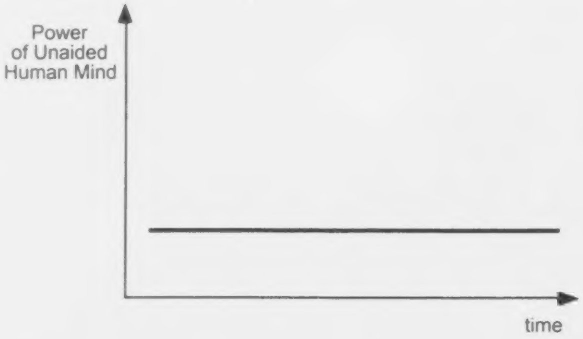


Figure 1: The power of the unaided individual human

**The Tension between Human and Computational Power.** In sharp contrast to the negligible change of the basic capabilities of the unaided, individual human mind, computational and communication technologies have changed dramatically. Moore's law (illustrated qualitatively in Figure 3) is the principle that computer capacity doubles every eighteen months. The principle, operative since the dawn of the computer age, shows no sign of abating and its implications have provided unique possibilities for creating new cognitive artifacts. One of the basic misunderstandings has been that while these technologies are necessary, they do not sufficiently allow humans to work more creatively and efficiently, to learn and understand more, and to collaborate more [Landauer, 1995].

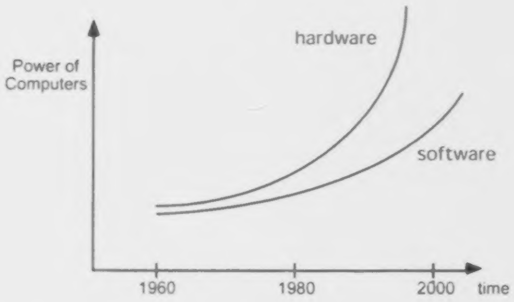


Figure 3: Computing power increases at an exponential rate

**The Collective Human Mind — Exploiting Social Interaction.** The Renaissance scholar does not exist anymore. Human beings have a bounded rationality — making satisfying instead of optimising a necessity [Simon, 1996]. There is only so much we can remember and there is only so much we can learn. Talented people require approximately a decade to reach top professional proficiency. When a domain reaches a point where the knowledge for skillful professional practice cannot be acquired in a decade, specialisation will increase, collaboration will become a necessity, and practitioners will make increasing use of reference aids, such as printed and computational media supporting external cognition [Bruner, 1996].

Much of our intelligence and creativity results from the collective memory of *communities of practice* and of the artifacts and technology surrounding them [Fischer, 1999b]. Though creative individuals are often thought of as working in isolation, the role of interacting and collaborating with other individuals is critical. Creative activity grows out of the relationship between an individual and the world of his or her work, and out of the ties between an individual and other human beings. The basic human capacities are differentially organised and elaborated into complex systems of higher psychological functions, depending on the actual activities in which people engage. These activities depend crucially on the historical and cultural circumstances in which people live [Resnick et al., 1991].

Figure 4 illustrates the major fundamental human inventions and creations that have increased the power of the unaided, individual human mind. Two important questions to ask today are: (1) Will computational and communication media equally impact humans as reading, writing and the printing press did in the past? (2) Will we be able to achieve another qualitative increase (indicated by the dashed line in Figure 4) by the development of new media and new technologies which exploit the possibilities of the *collective* human mind through social interactions?

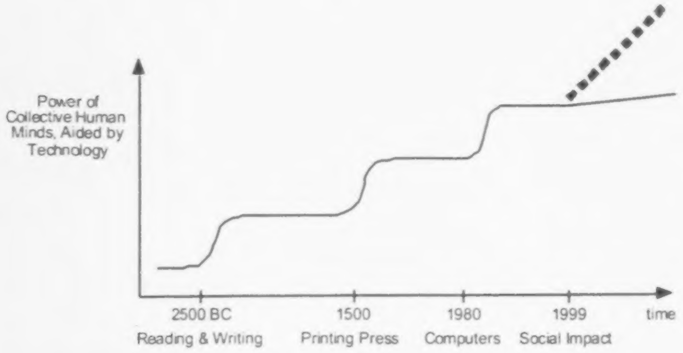


**Figure 4: The Power of the Collective, Aided Human Mind**

**A Motivating Example for Social Interaction.** One of our collaborating companies employs 700 help desk people. These employees help customers all day and every day to solve their problems. Thus, this setting appears to be an ideal environment to take advantage of social interactions, where the group at large could benefit from the creative act of the individual employee. In our example, help desk person **N** expends considerable effort to solve a customer's difficult problem. How should this effort be documented and shared with the other help desk people? Should person **N** *broadcast* (using some kind of "push-technology") this problem and its solution to the 699 other help desk people, as illustrated in Figure 5?

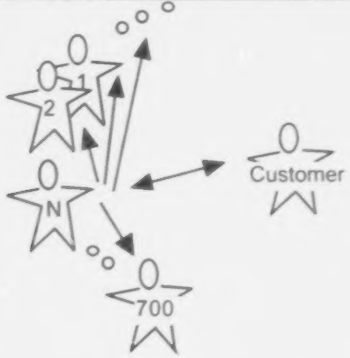


Figure 5: Information Overflow of Decontextualised Information Caused by Broadcasting

We claim that the answer is "no", because in general this information will not be relevant to the other help desk people at the same point in time. All of these people (like most knowledge workers) do not suffer from a scarcity of information, but from an information overload problem; and this problem is worsened by receiving more decontextualised information whose relevance is not recognised by the receiver at the same moment in time.

The more promising strategy is illustrated in Figure 6. The problem solving knowledge created and documented by person **N** is captured in an *information repository* (such as an organisational memory). It is made available either upon request (using "pull" technologies) or volunteered by the system (employing "push" technologies). So, in the future, when any of the 700 help desk employees encounters a problem in which the solution of person **N** is relevant, the information is readily available.

This example represents the kinds of experiences that are important for social interaction. One of the core challenges for social interaction is to collect creative solutions by individuals

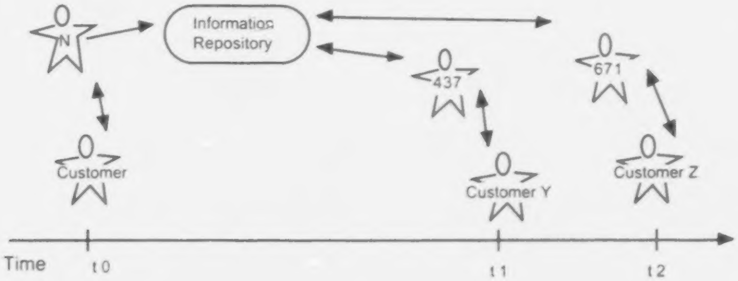


Figure 6: Contextualising Information to the Task at Hand and Supporting Learning on Demand

and make them available to others who encounter similar problems. This core challenge raises difficult technical issues such as: (1) computationally tractable representations of experiences, (2) retrieval technologies that recognise complex as well as surface similarities, (3) capturing significant portions of knowledge that practitioners generate in their work, (4) the effort required to contribute to organisational memory must be minimal so it will not interfere with getting the higher prioritised work done, and (5) developing a culture in which individuals are motivated to work for the good of the group or organisation [Grudin, 1994].

## A CONCEPTUAL FRAMEWORK FOR SOCIAL INTERACTION

The basic foundation for social interaction is that people think, work, and learn in conjunction or partnership with others, with the help of culturally provided tools and artifacts. For a conceptual framework (or theory) of social interaction to be interesting, to inspire, to guide and to inform the development of new media supporting social interaction, it should contain some specifications on how social interactions can be improved or altered in some significant way. A focus on social interaction has shifted our *internalist* view of seeing the mind as an information processor, and by assuming that the mind's operation is characterisable independent of its relationship to the external world to a *distributed* cognition view.

**A Group has No Head.** Distributed cognition [Norman, 1993] emphasises that the heart of intelligent human performance is not the individual human mind but groups of minds in interaction with each other and minds interacting with tools and artifacts. It is important to understand the fundamental difference of distributed cognition as it operates for the aided individual human mind. Distributed cognition between the individual human mind and artifacts (such as memory systems) often function well, because the required knowledge that an individual needs is distributed between the mind and the world (for example: an address book, a folder system of e-mail messages, or a file system). But a group has no head — therefore externalisations are critically more important for social interaction. Externalisations can create a record of our mental efforts, one that is "outside us" rather than vaguely in memory, and can represent situations that can critique, negotiate, and talk back to us.

**Symmetry of Ignorance.** As argued above, when a domain reaches a point where the knowledge for skillful professional practice cannot be acquired in a decade, specialisation will increase, collaboration will become a necessity, and practitioners will make increasing use of reference aids, such as printed and computational media supporting external cognition. Design [Simon, 1996] is one such domain par excellence. Complexity in design arises from the need to synthesise different perspectives of a problem, the management of large amounts of information relevant to a design task, and understanding the design decisions that have determined the long-term evolution of a designed artifact. The social interaction among stakeholders in design can be characterised by a "symmetry of ignorance" [Rittel, 1984], or an "asymmetry of knowledge". In designing artifacts, designers rely on the expertise of others [Galegher et al., 1990; Resnick et al., 1991] by referring to textbooks, standards, legal constraints, and especially previous design efforts. Project complexity forces large and heterogeneous groups to work together on projects over long periods of time. Knowledge bases should include not only knowledge about the design process but also knowledge about artifacts of that process — parts used in designing artifacts, subassemblies previously created by other design efforts, and the rationale for previous design decisions. Designers generally have a limited awareness and understanding of how the work of other designers within the project (or in similar projects) is relevant to their own part of the design task. The large and growing discrepancy between the amount of such relevant knowledge and the amount any one designer can possibly remember imposes a limit on a design in progress. Overcoming this limit is a central challenge for developers of systems that support social interaction [Nakakoji, 1998].

**Organisational Learning and Organisational Memories.** *Organisational Learning* focuses on recording knowledge gained through experience (in the short term), and actively making that knowledge available to others when it is relevant to their particular task (in the long term) [Fischer et al., 1996]. A central component of organisational learning is a repository for storing knowledge in an organisational memory. However, the mere presence of an organisational memory system does not ensure that an organisation will learn. Today, information is not a scarce commodity — the problem is not just to accumulate information, but to deliver the *right* knowledge at the *right* time to the *right* person in the *right* way. Organisational learning happens only when the contents of organisational memory are utilised effectively in the service of doing work. Efficient support for organisational learning raises many unresolved issues of how can we create a working and learning culture in which individuals are encouraged and willing to share; and how do we effectively collect individual knowledge and make it easily accessible to the entire organisation?

For sustained organisational learning, three seemingly disparate goals must be served simultaneously. Organisational memory must (1) be extended and updated as it is used to support work practices; (2) be continually reorganised to integrate new information and new concerns; and (3) serve work by making stored information relevant to the new task-at-hand. Organisational learning is a continuous cycle in which organisational memories play a pivotal role:

- Individual projects serve organisational memory by adding new knowledge that is produced in the course of doing work, such as artifacts, practices, rationale, and communications.
- Organisational memories are sustained in a useful condition through a combination of computational processes providing information and people actively contributing.
- Organisational memory serves work by providing relevant knowledge when it is needed, such as solutions to similar problems, design principles, or advice.

The intimate relationship between organisational memory and work practices implies that the contents of organisational memories must be easily accessible *within the context of work*. Computational support for organisational learning, therefore, must tightly integrate tools for doing work with tools for accessing the contents of organisational memories. Processes of information capturing, structuring, and delivery must be computationally supported as much as possible or they simply will not get done.

*Organisational memories* are information systems that are used to record knowledge for the purpose of making this knowledge useful to individuals and projects throughout the community of practice and into the future. Ideally, an organisational memory allows individuals within the community to benefit from the experiences and insights of others, by *actively* informing work practices at the point when the information is actually needed. That is, an organisational memory should not be simply a passive repository of information, but an interactive medium within which collaborative work can actually be conducted and through which the communication about work can take place and be established. Systems that support *organisational learning* and *organisational memories* will be useful for professionals working on complex tasks in large team environments. An example of an organisational memory is GIMMe, the Group Interactive Memory Manager [Fischer et al., 1996] which captures group email, automatically categorises it, and then provides context-sensitive search capabilities. These systems will have to be enhanced to capture richer types of information and provide more powerful categorisation and search techniques.

## EXAMPLES OF SYSTEMS IN SUPPORT OF SOCIAL INTERACTION

**Domain-Oriented Design Environments.** In our own past research efforts we have developed conceptual frameworks to empower individuals by developing domain-oriented design environments [Fischer, 1994] in a variety of different domains. By being domain-oriented, these environments support *human problem-domain communication*, making the computer invisible and bringing tasks to the forefront. Domain-oriented design environments (created over time as a joint effort among clients, domain designers, and environment developers) can empower individuals by:

1. letting them articulate a partial description of their tasks with the help of a specification component (see pane 4),
2. supporting the creation of an artifact with a construction component (see pane 2 and 3),
3. using a catalog of previous designs supporting design by modification (see pane 5),
4. signaling potential breakdowns with a critiquing component,
5. supporting the exploration of argumentation and design rationale (see pane 1), and
6. providing additional feedback with a simulation component (see pane 3).

**The Envisionment and Discovery Collaboratory.** The Envisionment and Discovery Collaboratory (EDC) (http://www.cs.colorado.edu/~l3d/systems/EDC/) [Arias et al., 2000] is a domain-oriented design environment under development supporting social interaction by creating shared understanding among various stakeholders, contextualising information to the task-at-hand, and creating objects-to-think-with in collaborative design activities. The EDC framework is applicable to different domains, but our initial effort has focused on the domains of urban planning and decision making, specifically in transportation planning and community development. Creating shared understanding requires a culture in which stakeholders see themselves as reflective practitioners rather than all-knowing experts [Schön, 1983]. The "symmetry of ignorance" is a defining characteristic of such collaborative design activities: stakeholders are aware that while they each possess relevant knowledge, none of them has all the relevant knowledge.

**Figure 7: The Envisionment and Discovery Collaboratory (EDC)**

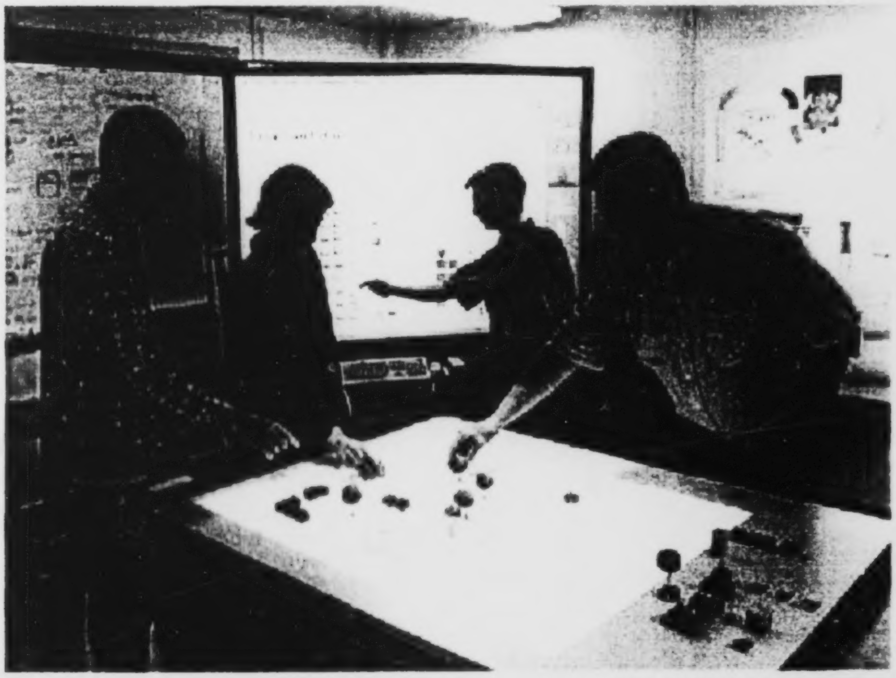


Figure 7 shows the current realisation of the EDC environment. Individuals using the EDC convene around a computationally enhanced table, shown in the forefront of the figure. This table serves as the Action Space for the EDC. Currently realised as a touch sensitive surface, the Action Space allows users to manipulate the computational simulation projected on the surface by interacting with the physical objects placed on the table. A second computer driving another touch-sensitive (vertical) surface is shown behind the Action Space table. This computational whiteboard serves as the EDC's Reflection Space. In the figure, users are filling out a Web-based transportation survey that is associated with the model being constructed. The Reflection and Action Spaces are connected by communication between the two computers using the Web as a medium. The entire physical space, through the immersion of people *within* the representations of the problem-solving task, creates an integrated human/computer system grounded in the physical world [Arias et al., 1997].

Much development of technology for learning and design builds on or is constrained by the "single user/single computer" interaction model. The EDC emphasises the creation of shared interaction and the cultural embedding for learning and design within the context of communities of learners. The EDC supports relevant crucial processes for social interaction by:

- dealing with a set of possible worlds effectively; thus, exploring design alternatives where an environment for a design dialog can be created.
- using the symmetry of ignorance (i.e., that all involved stakeholders can actively contribute) as a source of power for mutual learning by providing all stakeholders with means to express their ideas and their concerns.
- incorporating an emerging design in a set of external memory structures, and recording the design process and the design rationale.
- creating modifiable models, which help us create a shared understanding by having a "conversation" with the artifacts created, and thus, replacing the anticipation of the consequences of our assumptions by analysis.
- using domain-orientation to bring tasks to the forefront and support human problem-domain communication.
- increasing the "back-talk" of the artifacts with critics [Fischer et al., 1998].
- using simulations to engage in "what-if" games [Repenning, 1999].

The EDC is a contribution to creating a new generation of collaborative domain-oriented design environments. It shifts the emphasis away from the computer screen as the focal point to creating an *immersive* environment in which stakeholders can incrementally create a shared understanding through collaborative design. It is an environment that is not restricted to the delivery of predigested information to individuals, but it provides opportunities and resources for design activities embedded in social debates and discussions in which *all* stakeholders can actively contribute rather than being confined to passive consumer roles.

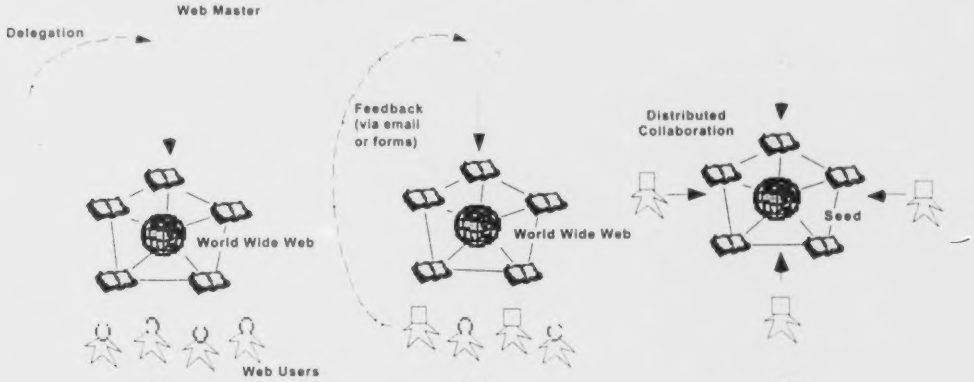
## IMPLICATIONS

**From Consumers to Designers.** Social interaction is impossible in communities where most members regard themselves as consumers. Consumers must evolve into power-users and co-developers who use artifacts and at the same time be able to modify and extend them. A strict separation between these two groups is undesirable and unproductive. One of the biggest potentials of information technology (which provides the potential to lead to another qualitative level of support for the collective, aided human mind; see Figure 4) is allowing people the option to become designers by changing and enhancing a software system. After all, software as already indicated by its name, should be "soft." One of the major contributions that information technology can lend to the world is to understand and exploit the potential of the malleable nature of software.

Individuals acting as designers must acquire a *new mindset* — no longer passive receivers of knowledge, but instead as active researchers, constructors, and communicators of knowledge. Knowledge is no longer handed down from above, but instead is constructed collaboratively in the context of work. Empowering individuals with convivial tools is grounded in the fundamental belief that humans (albeit not all, not all the time, nor in all contexts) want to be and act as designers [Fischer, 1998].

**New Conceptualisations of the World Wide Web (WWW).** Many people will argue that the most important new technology in support of social interaction is the WWW. The scope of this article does not allow to review all the new interesting developments, such as social filtering, recommender systems [Terveen et al., 1997], chat rooms, etc., but in analogy to the argument made with the exponential growth of computational power (see Figure 3), the WWW is a necessary medium for new forms of social interaction, but not a sufficient one. For example, the WWW in its current form does not support evolutionary design.

Figure 8 describes three different models of the WWW. Most WWW-based use engages the WWW as a broadcast medium (Model M1) in which content is predetermined at design time and placed on static WWW pages. Most popular general-purpose WWW tools provide support for the easy generation of this static content. As a broadcast medium, the WWW serves as a distribution channel and provides few opportunities for designers to interact with the information because the content was not originally designed to be interactive. Responding to the need for feedback from consumers, many WWW sites are evolving into forms that augment content with some communication channels. *Broadcast with feedback* (Model M2) provides links from consumer to producer such as allowing learners to provide feedback and ask questions by filling out forms. Although users can react to information provided by the author, this presentation model provides little support for evolution.



**M1** The Web as Broadcast Medium

**M2** Broadcast with Feedback

**M3** Evolutionary and Collaborative Design

**Figure 8: Making the World Wide Web a Medium for Collaborative, Evolutionary Design**

To support social interaction, users need to be able to use the WWW to collaborate on projects by *actively* contributing and by learning from all contributors (Model M3). The evolution of content and ideas is now the responsibility of the participating community of practice, focusing on the distributed generation of content and the reflection upon it. When a wide variety of individuals collaborate in a co-operative forum, the unique skills of all the members become a valuable resource in making the WWW useful in its current context. This model of the WWW poses a number of technical challenges, including the ability to add to an information space without going through an intermediary, and to be able to modify the structure of the information space.

**Decentralised Constructed Information Repositories.** The M3 model is a useful framework for understanding the processes inherent in the development of *open systems* [Fischer & Scharff, 1998]. For example, the development of open-source software systems such as the Linux operation system [Raymond, 1999] provides an interesting example of a reliable, useful, and usable complex system built in a decentralised "Bazaar style" by many, rather than in a centralised "Cathedral style" by a few. The Linux development model treats users simultaneously as co-developers and designers [Fischer, 1998a].

Open systems are examples of the first steps in illustrating the power of social interaction based on community participation. In addition to Linux there are other interesting examples:

- **Gamelan** (http://www.gamelan.com) is one of the first community repositories of Java-related information. The primary users of Gamelan are Java developers looking for information about what other people are doing with Java. Gamelan is a forum to facilitate the self-directed learning of members of the emerging Java community. The software developers who use the content are also the primary contributors, continuously adding new resources to the Gamelan repository. Gamelan was originally designed to be the official clearinghouse for all third-party uses of Java, and the site attempts to support any work that uses Java.
- The **Educational Object Economy** (http://www.eoe.org/) provides a more focused system than Gamelan. Currently realised as a collection of Java objects (mostly completed applets) designed specifically for education, the target users of the Educational Object Economy are teachers (presumably acting as consumers of completed applets) wishing to use new interactive technology, and instructional designers interested in producing educational software. The Educational Object Economy's primary goal is to provide educators with a collection of useful resources ready to be used to help students learn.
- The **Netscape Communicator** (http://www.mozilla.org) allows the decentralised development of source code and supports the centralised integration.
- The **Agentsheets Behaviour Exchange** (http://www.agentsheets.com/) is an initial prototype of a domain-specific system for sharing computational artifacts.
- The **"open source" movement** [O'Reilly, 1999] that is currently emerging as a new paradigm for software development represents an exciting perspective for a society of

lifelong learners. The "open source" approach regards software and other cognitive artifacts not as a commodity to be consumed, but one that is collaboratively designed and constructed — providing a model for the knowledge society of the future (for more information on "open source" see: http://www.tuxedo.org/~esr/writings/).

One important common feature of these systems is their support for evolution [Fischer, 1998b]. As new knowledge becomes available, members of the community could share new developments with each other. In all four systems, the repository administrators set up an initial *seed* that structures how information is added, presented, and searched by users. The goal is to create useful information repositories in a decentralised fashion. Because all systems are envisioned as tools that evolve at the hands of a community of users, all four are prime candidates to study the challenges, strengths, and weaknesses of open systems and social interaction.

**New Forms of Learning from a Lifelong Learning Perspective.** Lifelong learning refers to a society in which learning possibilities exist for those who want to learn. Figure 9 summarises four innovative forms of lifelong learning, and addresses their contributions toward the creation of mindsets and the media requirements generated by them.

| Form | Comple-menting Form | Contribution toward Mindset Creation | Major Challenges | Media Requirements |
|---|---|---|---|---|
| **self-directed learning** | **prescribed learning** | **authentic problems** | **problem framing** | **understanding evolving tasks** |
| learning on demand | learning in advance | coverage is impossible;<br>obsolescence is guaranteed | identifying the breakdown leading to the demand;<br>integration of working and learning | critics; supporting reflection-in-action |
| informal learning | formal learning | learning by being in the world | larger, purposive activities provide learning opportunities | end-user modifiability |
| organisational learning | individual learning | the individual human mind is limited | shared understanding | externalisations understandable by all stakeholders |

Figure 9: Overview of New Forms of Learning Contributing to Lifelong Learning

## CONCLUSIONS

Until recently, computational environments focused on the needs of individual users. As more people use computers for more complex tasks, it has become apparent that environments supporting social interactions among communities of practice, groups, and organisations are needed. However, this perspective does not necessitate the development of environments in which the interests of the group inevitably supersede those of the individual. Individuality makes a difference, and organisations get their strength to a large extent from the creativity and engagement of the individual. One of the important challenges for the future is to gain a better understanding of the relationship between the individual and the social.

## ACKNOWLEDGMENTS.

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## APPENDIX: BRIEF DESCRIPTION OF THE CONCEPTS USED IN THE PAPER

**Remark:** A complete glossary of the concepts developed and used in our research can be found at: http://Seed.cs.colorado.edu/dynagloss.MakeGlossaryPage.fcgi

**Cognitive Artifact:** Cognitive artifacts are objects and environments that aid the human mind by complementing its abilities and by strengthening its mental powers. Domain-oriented design environments are part of a research agenda to identify and create unique possibilities for computational media as a cognitive artifact. Examples of cognitive artifacts are books, calculators, spelling correctors, and other computational tools.

**Collaboratory:** A Collaboratory is a new concept denoting the merging of "collaboration" and "laboratory."

**Community of Practice:** Community of practice is a group of practitioners who work as a community in a certain domain. One objective of domain-oriented design environments is to support communities of practice through its domain-orientation which supports interaction at the level of the problem domain of the community of practice and not only on a computational level. Virtual communities of practice are supported with web-based domain-oriented design environments and with systems such as Behaviour Exchange and Dynasites.

**Distributed Cognition:** The knowledge which we have and need is not all in our minds, but to a large extent resides in the world (i.e., in artifacts of all kinds and in the minds of other people). A distributed cognition perspective raises many interesting issues: (1) how the knowledge in our heads and the knowledge in the world are related to each other; (2) how knowledge in the world can be learned on demand; and (3) whether we actively access the knowledge in the world or whether it is delivered to us.

**Domain-Oriented Design Environments:** Domain-oriented design environments are computational media that allow people to engage in more authentic tasks in their work practices by allowing them to deal with domains, and not fight with tools. Domain-oriented design environments make computers invisible and enable users to communicate with the problem domain rather than with computer tools. They extend construction kits by supporting not just the design of an artifact, but the design of a "good" artifact by increasing the back-talk of an artifact using critics. They support reflection-in-action as a design method. They are based on a multi-faceted architecture and are designed to use the seeding, evolutionary growth, reseeding process model.

**Evolutionary Design of (Complex) Systems:** Based on empirical findings that successful systems (software systems, buildings, cities) evolve, a paradigm shift is needed based on the following requirements: (a) software systems must evolve, they cannot be completely designed prior to use, (b) they must evolve at the hands of the users, and (c) they must be designed for evolution. Domain-oriented design environments, being based on the seeding, evolutionary growth, reseeding model, support evolutionary processes at the architecture level, the domain, and the artifact level.

**Organisational Memory**: Organisational memories provide shared information space for supporting a group of people (an organisation). The information space should be "living" in the sense that it is an evolving product of the work done by the members of the organisation as opposed to simply being a static storage of information.

**Symmetry of Ignorance (or Asymmetry of Knowledge):** Real world design problems transcend the knowledge of individuals and specific groups. All participants who have a stake in the design activity should be able to contribute their knowledge.

## REFERENCES

- Arias, E. G., Eden, H., Fischer, G., Gorman, A., & Scharff, E., (2000). "Transcending the Individual Human Mind—Creating Shared Understanding through Collaborative Design", *Transactions on Computer Human Interaction,* (to appear). Available at: http://www.cs.colorado.edu/~gerhard/papers/tochi99.pdf.
- Arias, E. G., Fischer, G., & Eden, H., (1997). *Enhancing Communication, Facilitating Shared Understanding, and Creating Better Artifacts by Integrating Physical and Computational Media for Design*, Proceedings of Designing Interactive Systems *(DIS '97)*, pp. 1-12.
- Bruner, J., (1996). *The Culture of Education,* Harvard University Press, Cambridge, MA.
- Card, S. K., Moran, T. P., & Newell, A. (1983). *The Psychology of Human-Computer Interaction,* Lawrence Erlbaum Associates, Inc., Hillsdale, NJ.
- Fischer, G., (1994). "Domain-Oriented Design Environments", *Automated Software Engineering,* 1(2), pp. 177-203.
- Fischer, G., (1998a). "Beyond 'Couch Potatoes': From Consumers to Designers." In IEEE (Ed.) *1998 Asia-Pacific Computer and Human Interaction, APCHI'98,* IEEE Computer Society, pp. 2-9. Available at: http://www.cs.colorado.edu/~gerhard/papers/apchi.pdf.
- Fischer, G., (1998b). "Seeding, Evolutionary Growth and Reseeding: Constructing, Capturing and Evolving Knowledge in Domain-Oriented Design Environments," *Automated Software Engineering,* 5(4), pp. 447-464. Available at: http://www.cs.colorado.edu/~gerhard/papers/final-journal-sept30-97.pdf.
- Fischer, G., (1999a). "Lifelong Learning: Changing Mindsets." In G. Cumming, T. Okamoto, & L. Gomez (Eds.), *7th International Conference on Computers in Education*

*on "New Human Abilities for the Networked Society" (ICCE'99, Chiba, Japan),* IOS Press, Omaha, pp. 21-30.

- Fischer, G., (1999b). "Social Creativity, Symmetry of Ignorance and Meta-Design." In L. Candy & E. Edmonds (Eds.), *Proceedings of Creativity & Cognition 1999,* ACM Press, New York, pp. 116-123.
- Fischer, G., Lindstaedt, S., Ostwald, J., Schneider, K., & Smith, J., (1996). "Informing System Design Through Organisational Learning." In *Proceedings of the Second International Conference on The Learning Sciences,* Association for the Advancement of Computing in Education (AACE), pp. 52-59. Available at: http://www.cs.colorado.edu/~gerhard/papers/InformingSystemDesign.pdf.
- Fischer, G., Nakakoji, K., Ostwald, J., Stahl, G., & Sumner, T., (1998). "Embedding Critics in Design Environments." In M. T. Maybury & W. Wahlster (Eds.), *Readings in Intelligent User Interfaces,* Morgan Kaufmann Press, pp. 537-559.
- Fischer, G. & Scharff, E., (1998). "Learning Technologies in Support of Self-Directed Learning," *Journal of Interactive Media in Education,* 1998(4), pp. www-jime.open.ac.uk/98/4. Available at: www-jime.open.ac.uk/98/4.
- Galegher, P., Kraut, R., & Egido, C. (Eds.), (1990). *Intellectual Teamwork,* Lawrence Erlbaum Associates, Inc., Hillsdale, NJ.
- Gardner, H., (1991). *The Unschooled Mind,* BasicBooks, New York.
- Grudin, J., (1994). "Groupware and social dynamics: Eight challenges for developers," *Communications of the ACM,* 37(1), pp. 92-105.
- Illich, I., (1971). *Deschooling Society,* Harper and Row, New York.
- Landauer, T. K., (1995). *The Trouble with Computers,* MIT Press, Cambridge, MA.
- Nakakoji, K., (1998). *Workshop on "Collective Creativity in Design through Concept Externalisation" (CCDCE ),* at http://hawk.aist-nara.ac.jp/CCC/sakigake/.
- Norman, D. A., (1993). *Things That Make Us Smart,* Addison-Wesley Publishing Company, Reading, MA.
- O'Reilly, T., (1999). "Lessons from Open Source Software Development," *Communications of the ACM,* 42(4), pp. 33-37.
- Raymond, E. S., (1999). *The Cathedral and the Bazaar,* at http://www.tuxedo.org/~esr/writings/.
- Repenning, A., (1999). *Agentsheets,* at

http://www.cs.colorado.edu/~l3d/systems/agentsheets/.

- Resnick, L. B., Levine, J. M., & Teasley, S. D. (Eds.), (1991). *Perspectives on Socially Shared Cognition,* American Psychological Association, Washington, D.C.
- Rittel, H., (1984). "Second-Generation Design Methods." In N. Cross (Ed.) *Developments in Design Methodology,* John Wiley & Sons, New York, pp. 317-327.
- Schön, D. A., (1983). *The Reflective Practitioner: How Professionals Think in Action,* Basic Books, New York.
- Simon, H. A., (1996). *The Sciences of the Artificial,* (Third ed.), The MIT Press, Cambridge, MA.
- Terveen, L., Hill, W., Amento, B., McDonald, D., & Creter, J., (1997). "PHOAKS: A System for Sharing Recommendation," *Communications of the ACM,* 40(3), pp. 59-62. Available at: http://www.acm.org/pubs/articles/journals/cacm/1997-40-3/p59-terveen/p59-terveen.pdf.

## Crossroads of the New Millennium

# Encouraging Students To Acquire Key Skills And Manage Their Own Learning

Prepared and Presented

By

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## Poster Presentation

# Abstract

The UK Higher Education system is being encouraged to provide opportunities for students to acquire key skills/employability skills, and for them to become better learners with a greater awareness of their individual learning needs, including the need to develop habits that will lead to life-long learning. The paper considers some of the main issues in terms of the key skills debate and the wider learning agenda, and it examines the concept of the personal development file as an instrument that offers the potential to achieve a number of important objectives to the benefit of students, staff and HE institutions.

# Encouraging Students to Acquire Key Skills and Manage their Own Learning

## INTRODUCTION

A number of interesting developments are taking place in UK higher education which have the potential for making learning more satisfactory, for producing graduates who are more attractive to employers, for creating a basis for life-long learning, and for more-nearly satisfying the demands that society rightly places on the system. The principal developments are: the encouragement for students to acquire what have come to be called key skills and the acceptance by HE institutions to make the necessary provision, the encouragement for students to take advantage of ALL possible opportunities to acquire skills, including those available outside the lecture room be this by undertaking voluntary work in the community or participating in students union activity, and the encouragement for them to take some responsibility for their own learning by becoming aware of their learning needs, reflecting on their learning, and perhaps keeping some kind of record or log, or what is becoming fairly widely known as a personal development file.

Whilst offering substantial potential benefits these developments are not likely to be realised without detailed planning, extra investment in resources, and not least, a radical change in culture in some institutions. The paper examines the various issues, taking key skills first, then considering the acquisition of skills outside the curriculum, and finally bringing this together by discussing the concept of the personal development file.

## ACQUIRING KEY SKILLS WITHIN THE DEGREE PROGRAMME

The UK Government has shown itself to be acutely aware of the need to have students in higher education who will graduate not only with the traditional intellectual qualities and skills, but also with skills that will make them attractive to employers and will create a sound basis for life-long learning. To this end both they and individual institutions have invested considerable sums of money in order to address a perceived need to improve the nation's competitive performance and to answer employer complaints that graduates come to them with a deficit in fundamental skills such as the ability to communicate, to work in teams, and even to demonstrate an ability in basic numeracy.

There is plenty of evidence from employer surveys over the past few years to be certain that their prime interest is in recruiting graduates who possess the appropriate non-academic, or transferable skills; indeed, for many firms this is of more importance than the particular academic subject the student has studied. There is nothing new about this thinking: in the early 1990s a report concluded that "it was personal attitudes (motivation, character and attitudes) and the 'non-academic skills' which were most important. Among the latter, the ability to work as part of a team, and social and communications skills were most sought after." Similarly, according to the report it was "becoming increasingly apparent that at least 40% of job opportunities are not geared to any specific training or set of subjects studied."

1. It seems only fair to say that many HE institutions have been always been aware of the need to adopt a wider definition of student development than the traditional intellectual one, not only because it is held to be right, but also because one of the critical performance measures is graduate employment rate. To this end they have, for example, made provision for teaching communications skills, encouraged group and team activities, and so on. However, the whole key skills agenda was given a substantial boost as a result of the report of the National Committee of Inquiry into Higher Education, chaired by Sir Ron Dearing (the 'Dearing Report') which recommended that learning outcomes should be specified in, amongst other aspects, key skills; these skills were listed as communications, numeracy, use of information technology, and learning how to learn.
2. There is no single list of key skills but the 'Dearing four' are now widely accepted and a further two are included in the Qualifications and Curriculum Authority's (QCA) list, namely working with others and problem solving. This is itself based on the earlier NCVQ *core* skills list, renamed *key* skills in 1996
3. The six QCA key skills form what has become known as the national framework and is backed by a comprehensive set of criteria for assessing and achieving the skill at a number of different levels.

There is no suggestion, as far as one is aware, that this precise framework will be forced on institutions, and indeed it seems likely that many would find it unacceptable given its perceived bureaucratic format. This, of course, is a very different position to the now widely held view that HE institutions should engage in skills development of their students in the broad sense. What they regard as important skills, or key skills, is left to institutions, and even departments within institutions, to decide just which skills are appropriate for them and this will probably remain the position.

Other lists of desirable skills that graduates should possess have been produced from time to time, some of them far longer than the ones noted above; the Association of Graduate Recruiters, for example, talk about 'self-reliance skills' and list twelve aspects including amongst other things - perhaps better described as attributes, rather than skills - self-confidence, coping with uncertainty, political awareness, etc. Appropriately for us in the present discussion they say that "the self-reliant graduate is aware of the changing world of work, takes responsibility for his or her own career and personal development and is able to manage the relationship with work and with learning throughout all stages of life." (4).

A number of issues need to be resolved when making provision for key skills opportunities in degree programmes and these are as follows:

a) **Embedded or taught independently.** Whether key skills should be integrated in the curriculum or delivered as independent stand-alone modules is a matter for debate and decision. There is no correct answer, but rather advantages and disadvantages in both cases. The arguments for embedding (that is, building into the curriculum) are that academics will have to take key skills more seriously and are more likely to accept ownership; students will see key skills as more real and relevant if they are directly related to subject matter; skills such as problem solving and communications have the potential for helping students improve their academic performance.

   The arguments against this methodology, and therefore in favour of creating stand-alone/purpose-designed modules, are that academics might well feel that they are not qualified to teach key skills; similarly teaching key skills will leave less time, academics might argue, for the subject matter; there could be student resistance in that some will feel that they entered university to learn about physics, or economics, etc. But, of course, this argument could apply however the key skills are delivered.

b) **Speakers – Reports Assessment.** Difficulty in measuring student ability and competence in some key skills is thought to be difficult; for example, how is a person's ability to work with others to be measured. Further, how are different levels or degrees of attainment and competence to be measured? (It should be noted, however, that the national QCA framework noted above does provide detailed assessment criteria for all the skills).

c) **Accreditation.** There has been considerable debate in the UK on whether separate recognition, say in the form of a certificate, should be given to students who have acquired key skills. Where a student has acquired an array of personal skills through, for example, extra curricular activity how might this be recognised formally? One well-publicised scheme is the 'York Award' developed by York University; the author's own institution is piloting a City and Guilds Personal Development Award.

d) **Finding Time in the Programme.** Justified or not, it might be felt that some degree programmes are already overcrowded and cannot stand to be 'burdened' with any 'extra' material. It would, however, be a very hard line to take and seems unlikely that even the most crowded course could not find some time in which to help students develop skills that make them more employable. As a minimum it would now be generally agreed that HE institutions should accept some responsibility for providing opportunities for students to enhance their personal skills.

e) **Staff Motivation and Development.** A further issue is that of academic staff motivation: how can they be motivated to put across and teach aspects of student personal development which is perhaps outside their own direct experience and individual subject specialism? Is it reasonable to expect them to do so? Should it be carried out by specialist staff or those particularly interested in student welfare and development rather than shared between all staff in a department? What is the role for staff development? There might well be different models within the same institution; in the author's institution one department has all staff sharing in a study skills programme which is organised through the personal tutor system; another department has two members of staff who take a particular interest in this aspect and undertake it in addition to their own specialist subject teaching.

f) **Centralised or De-centralised Provision?** A further issue, closely related to points a) and f) above, concerns the level within an institution at which provision for key skills should be made. There are arguments for providing it centrally across the institution where specialists can offer their services; duplication is avoided and it should be possible to take advantage of scale economies. On the other hand the particular departmental and subject flavour is lost which might or might not be thought to be important; again, there might well be timetabling complexities in centralised provision.

## ACQUIRING SKILLS OUTSIDE THE CURRICULUM AND DEGREE PROGRAMME

The enormous value of acquiring skills through work-based learning/sandwich courses/co-operative education has long been recognised by all involved in such schemes, indeed many would argue that degree programmes which integrate work placements with the academic input are superior to 'straight academic' degrees (5). (The arguments will be familiar: students mature; they learn about the world of work in the widest sense; they have opportunities to acquire new skills and enhance existing skills; they are likely to become more confident; they are likely to be more attractive to employers on graduation, and so on).(6). The Dearing Commission recognised the benefits that work experience can confer and recommended an expansion in such provision.

Under the present heading the focus is not on such formal provision where a work placement of, say, six or twelve months is an integral part of the degree, but informal work and other student activity outside the curriculum. Whilst the value of formal work placements has been recognised attention more recently has focused on the possible benefits accruing from other, less formal activity; in other words there is the potential for acquiring many skills through part-time jobs which students often - and now more frequently are forced to - undertake, and from involvement in student activities.

Students 'even' working in a bar or filling shelves in a super market acquire skills: they work with other people, they might well have to handle difficult customers, they will certainly have to communicate, they might well have to manage their time effectively and plan ahead, they might have opportunities to observe how managers operate and how the firm functions. The important point is to make students aware of the opportunities for learning and to encourage them to take advantage of the opportunities.

Many opportunities exist in universities and colleges for involvement in student activities, both through the many societies and through the students union and by acting as a course representative. Skills acquisition in many forms is to be had and, to some extent, it is a matter of raising awareness and making explicit what was previously implicit. By becoming involved in union and society activities students can hope to develop, amongst other skills, time management, chairing meetings, debating and presenting cases, listening and other communications skills, team working, assertiveness; by helping with the production of newsletters and other publications writing skills and IT skills can be enhanced. In some cases students act as mentors to students in other year groups thus gaining yet another type of skill.

Another way of looking at such activity is to accept that there is a broader learning agenda than the traditional one that focuses on the development of purely intellectual skills (not that anyone is attempting to downgrade this); similarly, there are lots of learning opportunities via which to develop both personal and technical skills if only students can be both made aware of them and encouraged to participate in them. A number of institutions have achieved this by means of publishing information booklets and guides, often co-ordinated by students for students. The author's institution has for the past two years produced a directory of opportunities entitled 'Stepping Stones to Success' which lists opportunities in the students union and related spheres and some of the opportunities for involvement in the local community (e.g. Special Constabulary); produced by the students, this has been distributed across the university. Personal tutors have been asked to help raise awareness amongst their tutees of the many opportunities which exist and to encourage them to make maximum use of these, without jeopardising their routine academic work, of course!

Running in parallel with this is a student training function led by the Student Development Co-ordinator, a full-time person whose principal remit is to train course representatives and to offer support in training students to train fellow students. This function has been expanded to include offering tuition to students in some of the personal skills and study skills.

## THE CONCEPT OF THE PERSONAL DEVELOPMENT FILE (PDF)

The instrument through which the above inputs and activities - key skills and personal development opportunities - can be drawn together is the personal development file in which the student records his/her achievements and reflects upon them, emphasising what he/she has learned.

This concept, although certainly not new, is at the heart of current debate in UK higher education and the subject of a consultation process being carried out by the HE Quality Assurance Agency following recommendation 20 of the Dearing Commission (2). This recommended "that institutions of higher education, over the medium term, develop a Progress File. The file should consist of two elements: a transcript recording student achievement," and second "a means by which students can monitor, build and reflect upon their personal development." The Dearing Commission used the term personal development planning, arguing that this would act as an aid to learning (knowing how/what/when to learn), as an aid to personal development (know/improve self), and as a means of maintaining evidence of learning and capability of both a formal and informal nature which students could use when presenting themselves to employers.

Various terms are in use and, in the main, they describe what amounts to the same thing: the student maintains some kind of learning log, reflective journal, personal development file, personal and academic file, professional academic file. The essential point is that the process requires reflection on what has been, and is being, learned and on planning for future learning. This clearly relates to the skills development discussed above both in the formal sense where it is part of the curriculum within modules and the wider degree programme, and to the less formal aspects developed by extra-curricular means.

There is now a substantial amount of evidence within the wider UK HE system from which to conclude that such a process is worth embarking upon. The PADSHE (Personal and Academic Development for Students in Higher Education) programme, initiated by Nottingham University's English Department, is one of the more publicised schemes and has claimed quite an impressive degree of success at institutions where it has been piloted. Not least of the aspects in which such schemes are seen to be successful is the way they link to personal tutor systems and hence to improved student support mechanisms.

The consultation document on Progress Files issued by the Committee of Vice Chancellors and Principals (CVCP) and the Quality Assurance Agency (QAA) listed a range of benefits, in addition to the potential for improving personal tutoring, which they felt would result from the introduction of the concept. For students these are: improved capacity to plan their own academic programmes; more effective monitoring and reviewing of own progress; improved awareness of how they are learning, etc; recognition of own strengths and weaknesses; recognition of opportunities for learning and personal development outside the curriculum; better preparedness for employment.

For staff the benefits are, in the view of the consultation document: more independent learners; more effective use of learning experience; a mechanism for recording career-related skills; improved understanding of the development of individual students and ability to write more meaningful references. Related benefits were also listed for departments and institutions.

The important point is that the principal aim is to help students to become more effective learners by helping them understand HOW they are learning and to discourage the idea that learning is a one-off activity. Like the key skills agenda, however, there are issues to consider, not least the possibility that students will fail to see the value of the PDF. There is likely to be a need to sell the concept to both students and staff and to provide the necessary training and development. It might be deemed necessary to introduce a system of reward and/ or sanctions according to whether the PDF is completed satisfactorily, one possibility being to build in a mark as part of the assessment of, say, a skills-related module.

A fundamental issue concerns the basic format of the PDF; there are several models currently in use in the UK, many of them similar but with slight differences which cater for perceived departmental and/or subject needs, for differences in departmental culture, and in some cases according to whether the PDF is related to professional institution requirements. A decision on the degree to which the PD is to be integrated with the personal tutor system also needs to be made. Finally, some departments have included a learning styles questionnaire with the PDF so that the first task for new students is to discover more about how they learn and what their learning needs are; in this way particular weaknesses can be addressed at an early stage.

## CONCLUSION

Students are certainly being encouraged by many HE institutions in the UK to acquire key skills and personal skills that will make them more employable and create a basis for life-long learning. Institutions have come to acknowledge that they have a duty not only to prepare students for work by encouraging them to acquire skills, but also to provide opportunities for such acquisition, be this through appropriate curriculum design or via participation in extra-curricular activity

This philosophy behind this thinking is conveniently summed up as follows: "Higher Education has traditionally been based on the assumption that key skills would automatically, if not incidentally, be acquired by students during their undergraduate studies, either through the curriculum or as a by-product of self-directed extra-curricular activities. This Project will address the need for universities to accept more consciously a responsibility for the provision of opportunities for student self-development and key skills acquisition, and further enhance their employability." (7).

There is also a significant move to a situation where students do more to manage their own learning. The concept of the personal development file with the associated personal and academic development planning would appear to offer a valuable means of accomplishing this aim; encouraging students to reflect on all aspects of their learning, to be conscious of their learning needs, and to constantly seek to improve weak aspects in their studying and their performance, can only create more effective learners.

## REFERENCES

- *Enhancing Employability and Educational Experiencee*, by Alan Jenkins and David Pepper. *Standing Conference on Educational Development (CID)*. Paper 27 1992.
- *Report of the National Committee of Inquiry into Higher Education - Higher Education in a Learning Society*. HMSO. 1997.

- *National Council for Vocational Education.*
- *Skills for Graduates in the 21st Century.* The Association of Graduate Recruiters. 1995.
- *Work Experience: Expanding opportunities for undergraduates*, by Lee Harvey, Vicky Geall and Sue Moon, Centre for Research into Quality. University of Central England in Birmingham, 1998.
- *Is there a downside to industrial placements?* by T A Pickles. Asia-Pacific Conference on Co-operative Education, Hong Kong, August 1998. Proceedings.
- *Student Self-Development and Key Skills Acquisition.* DfEE-University of Bradford contract 1997,"

TEND 2000

## Crossroads of the New Millennium

# The Needs Of Intermediate Professions:
# Middle Engineers And Middle Managers

Prepared and Presented

By

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## Poster Presentation

## THE INTERMEDIATE PROFESSIONS IN FRANCE

The distinction between training and the level of training is relatively clear, though the way they correspond is much more complex in terms of employment level.

Of course, collective agreements expect a correspondence between employment and the training required. In the educational system, we can particularly note the first job level, though this aspect, in relation to agreements, is rarely applied in small and medium sized businesses or industry. More recent agreements (pharmaceutical industry) make very little reference to required knowledge.

Employment is composed of:

1. complexity
2. responsibility
3. autonomy
4. necessary knowledge
5. necessary experience

If the baccalauréat* is the knowledge reference in France, **the first job reality, for young holders of a professional baccalaureat is: employee-worker**.

For **the holders of Bac +2 to 4** (2-4 years of study following the French baccalaureat), **the first job** comes into the scale of **"intermediate professions"**. In this context, the application made by a young graduate, over and above his level of knowledge, is analysed in terms of:

- skills related to the job applied for
- ability to grasp the complexity of the job on offer
- ability to take responsibility
- aptitude for the autonomy necessary to the job

☐ *IUT CONSULTANTS : French organisation specialised in the development of higher technological education and training*

☐ *Baccalauréat : Terminal Degree in the French Secondary Schools (Lycées)*

☐ *IUT : University Institute of Technology (2-year courses post baccalaureat)*

☐ *DUT : Terminal diploma of IUT*

☐ *IUP : University Professional Institute (4-year courses post baccalaureat)*

## THE CHALLENGES OF HIGHER TECHNOLOGICAL EDUCATION AT THE INTERMEDIATE LEVEL

When it is a question of higher technological education, we do **not only think in terms of engineers or PhDs**. Whether it be in developed or in emerging economies, intermediate technological education is developing everywhere, i.e. supplying a **qualification which comes between secondary education and the qualified engineer**.

Coming from the French IUTs and STSs, and soon from the professional Bachelor*, from former British Polytechnics, now universities, and from German Fachhochschulen, or the Belgian civil engineering schools, are real people with a practical background**, which combines knowledge with skills and an ability to grasp the know-how of the firm**. They form the skill nucleus for the firm.

## WHAT NEEDS DOES THIS SYSTEM RESPOND TO?

Between the technician who operates directly in the production process, either of goods or of services, and the engineer or manager who is placed upstream of this process (creating, organising and forecasting), current economies **need "professionals on the ground" at intermediate level**.

- This function has for a long time been the **job of the foreman**, someone who has worked his way up from the ranks through experience, a guardian of the firm's know-how. However, his "academic" training, usually rather basic, **today limits his possibilities** to adapt to the rapid technical and relational developments with the firm.
- Little by little, the **need for a "middle manager"** and a "**middle engineer**" has become obvious, one capable of understanding and mastering the production process, **able to adapt, party to technological changes** and having the skill to be the interface between technician or employee on the one hand, and engineer or manager on the other, in both directions.
- The needs of modern economies have known rapid, diverse and multiple developments; this has led to a discrepancy towards top qualifications at all levels: nowadays**, the worker must have skills and knowledge way beyond that formerly required of him**.

## HOW DO WE DISTINGUISH HIGHER TECHNOLOGICAL EDUCATION STREAMS AT INTERMEDIATE LEVEL?

We must refer to the **target aimed** at: **respond to economic requirements as professionals at intermediate level**, between that of the technician and that of the engineer.

Professional profiles are varied and constantly evolving but are based on **mastery of current technologies**, which are rapidly changing, and on **an aptitude for human relations**. There are not only technical changes to be considered: the professional field is not isolated from the economic and social context.

**Higher technological education at intermediate level** must, therefore, **"stick to reality"**, **be in touch with business**. . . and must **anticipate technological and sociological developments**. It is this context which enables the **main characteristics of such a system** to be defined.

## RELEVANCE TO THE NEEDS OF THE SOCIO-PROFESSIONAL ENVIRONMENT

It is no longer merely a question of the acquisition of knowledge (the traditional role of **the** university), this must still be adaptable to their professional objective – which pre-supposes the acquisition of know-how.

- *DESS : 5- year Diploma post baccalaureat*
- *Professional Bachelor : 3-year professional diploma post baccalaureat (new diploma)*

It is, therefore, **less about knowledge and more about skills**: moreover, we are well aware that there is a gradual slide from the idea of a diploma (sum of knowledge) towards the idea of skill reference (which sanctions professional ability, the ability to do "something").
**It is the employment market which, as a last resort, sanctions the type of training**.

Alongside classic university teaching, which remains the depository of "knowledge" and guarantor of its mastery, particularly through research, which is fundamentally essential, a **different type of teaching must be developed**, one which is adapted to these objectives aimed Such training must be carried out in association with companies and with them, must develop a rich and varied exchange flow; the trainers themselves must develop through **contact with the company**, bringing in their skills and helping it to benefit from their technical abilities. In return, they will receive this permanent opening into the real world, which will add to the quality of their teaching.

From this point of view **there is no technological teaching other than that associated with**:

- **courses** led by both **teachers and professionals**
- **further education** negotiated with companies
- feasibility of this wherewithal

There is no technological teaching apart from that immersed in the economic fabric of companies.

## TEACHING ADAPTED TO THE OBJECTIVE

The result of all this in this type of training is **that the teacher's mission is quite specific**. It has nothing to do with classic teaching. The teacher must clearly be master of a certain amount of **"knowledge"** and also of **"know-how"**: along with his higher level of knowledge, he must be **familiar with technological reality** and ready to keep up with it. In fact, there is no higher technological teaching without an important amount of **practical work**, which are, on the one hand, experience in a real-life situation and an apprenticeship and, on the other, **a methodological training**.

The teacher must be party to the strong "educational intensity" which this type of training supposes: **lessons, tutorials, practical work**. The teaching timetable is heavy if we add continuous assessment, projects, work experience, simulations…

The teacher must therefore find in the exercise of his possession, the motivation which will serve the training objectives. These are about **preparing students for the real world of work**. The teacher's tasks, therefore, must be defined in accordance with this objective and appropriately developed.

In this type of training, **the teacher must have the desire and the means to form a partnership with the company**.

The objectives of such training **associate knowledge, skills and know-how**. They require the teachers concerned to be highly **adaptable**.

The proposed challenge includes purely educational action as well as work on information "research" in the companies.

- transmission of knowledge often acquired at master level to students of an often lower level.
- Assimilation of technologies used in companies and learning how to use them.

The status of teacher of **teacher-researcher** in France is particularly suited to this type of work, **but methods of promotion and habits must be radically modified**.

What we need are men and women who are concerned with transfer and research of information, not necessarily of speculations which remain the basic terrain of university research.

From this point of view, the recent experience of **Technological Universities in Mexico is interesting**. The teachers there are recruited with the clearly defined mission of making direct contact with firms, even the smallest of these, and to develop a partnership with them. We get the feeling that, in some cases, this mission is just as important as the teaching.

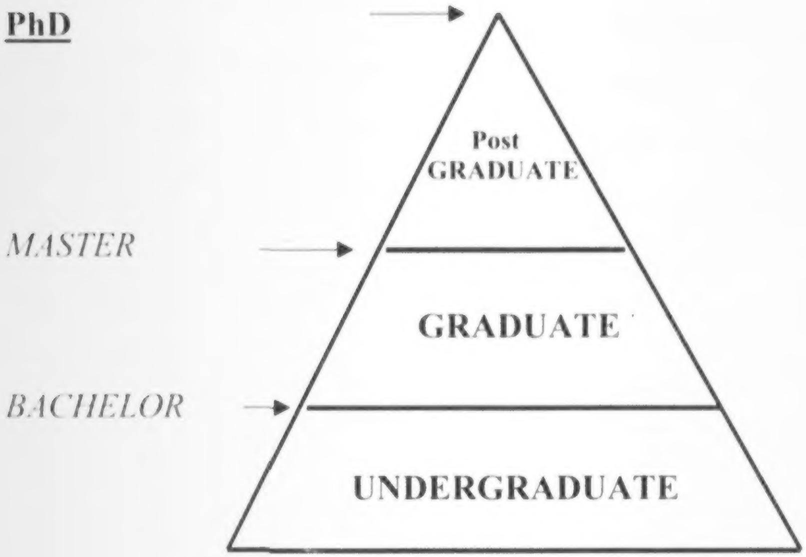
## TECHNOLOGICAL PLATFORMS

We often hear it said that this type of teaching is expensive. This is true if we confine ourselves to raw data: this type of training requires numerous, varied and effective technical means: **student placement, the necessity of responding to the needs of the firm through further education and technology transfer, imposes it** (These means constitute an essential motivating factor both for the students and their teachers).

We must, however, **relativise this aspect of "cost"**, first of all, according to the increased internal output of these streams in general; and also through the profitability made possible through these exchange channels with firms.

The human and technical means essential to the satisfactory running of these channels and their correspondence to training objectives serve the beginnings of a new idea: that of platform technology, dedicated, of course, to teaching, but which is at the same time a vector essential to business openings. These platforms unite all the skills necessary to the training dedicated to one or several fields of work. In this domain, it is certain that economies in "costs" become feasible as regards equipment and writing it off, by limiting the increase in number of platforms within the fields of work, without adding to training levels.

## THE UNIVERSITY LEVELS



**PhD**

*MASTER*

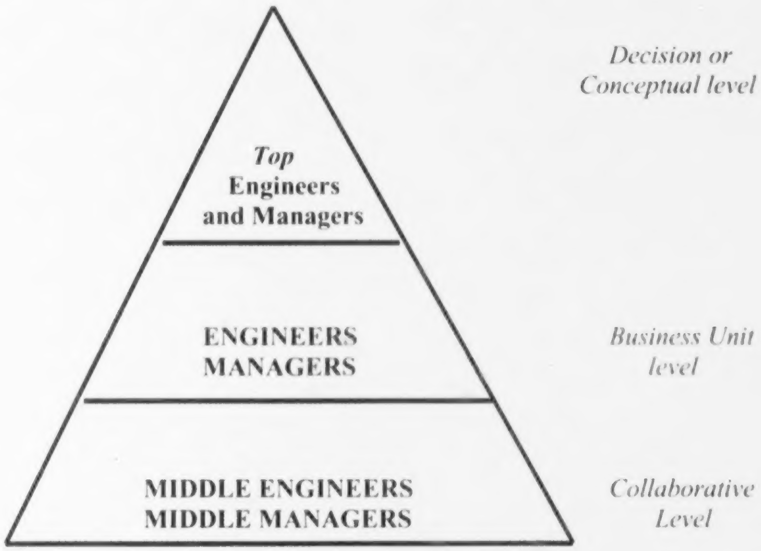
*BACHELOR*

**Post GRADUATE**

**GRADUATE**

**UNDERGRADUATE**

## THE ECONOMIC NEEDS IN THE FIELDS OF ENGINEERING AND MANAGEMENT



***Top***
**Engineers and Managers**

*Decision or Conceptual level*

**ENGINEERS MANAGERS**

*Business Unit level*

**MIDDLE ENGINEERS MIDDLE MANAGERS**

*Collaborative Level*

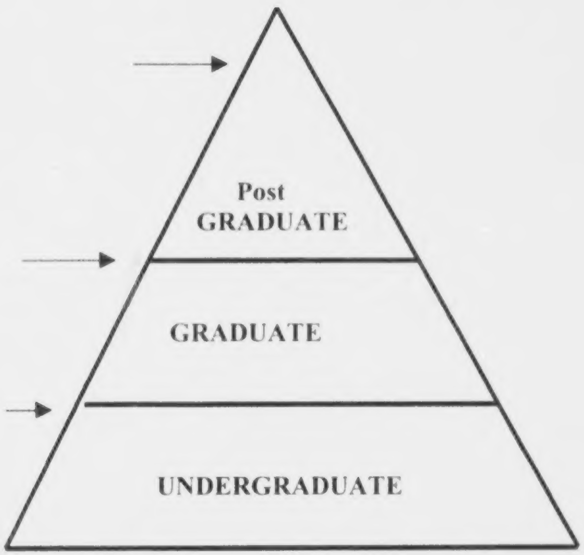
## THE ENROLLMENT OF STUDENTS BY LEVEL

PHILIPPINES (1997/98)

*7500*
(0,5 %)

*85 000*
(5,3 %)

*1.5 Million*
(94 %)


Post GRADUATE
GRADUATE
UNDERGRADUATE

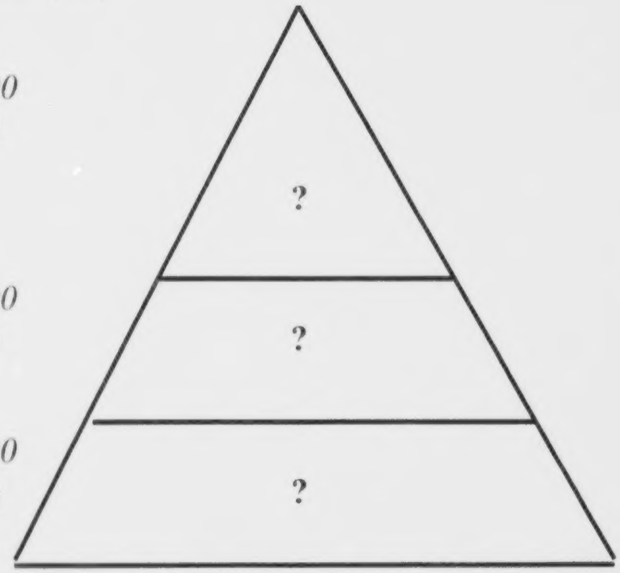
## THE NEEDS OF ECONOMY BY LEVEL

FRANCE (96)

*200 000*
*(15 %)*

*300 000*
*(23 %)*

*800 000*
(62 %)



## Crossroads of the New Millennium

# Science Education And Controversial Issues:
# A Case Study

Prepared and Presented

By

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## Poster Presentation

# Abstract

The media plays a crucial role in the transfer of scientific information on ecological problems to the public. The lack of complete documentation of the reporters often causes confusion in the readers.

A constructivistic learning process has been planned with the students of a primary and secondary schools in Genoa (Italy) to approach the problem of the diffusion of the alloctonous algae *Caulerpa taxifolia* (Vahl) C. Agardh in the north western Mediterranean Sea. The impact of the introduction of this tropical species is still debated in specialised literature, and supplies a good case-study to the discussion about science education and controversial issues.

To reach a self-made opinion about the "caulerpa case", the students had to discuss initially all the general information they could find. They observed that the opposite information often reported by the media prevented people from understanding the ecological problem and participating in its solution, however, the group declared that the scientists "must" know the answers to the problems produced by the exponential diffusion of the species. More information has been added to the group's discussion, proposing some crucial scientific papers for a critical analysis.

The results of this knowledge process form the self-made opinion of the group and have been transmitted to the scientific community during an international workshop about *C. taxifolia*. A concept map has been constructed to verify the effectiveness of the process. After the discussion of the recommendations from UNESCO about the invasive species of Caulerpa in the Mediterranean Sea, the students concluded that their attention to each fact, altering the natural equilibrium of the Mediterranean Sea, would remain high.

## INTRODUCTION

Dealing with science, the media's task must be to present the facts as accurately as possible. In the workshop "Reporting on scientific issues" (BOWMAN, 1998), the Canadian Science Writers' Association stressed that the media personnel handling the environmental problems must be well versed in the topics they report to a heavily relying public. The workshop focused also on the close connection between pertinent information coming from the scientists and intellectually honest and scientifically correct reports from the media writers.

At the end of January 1998 a local Italian newspaper reported the eradication of a colony of *Caulerpa taxifolia* (Vahl) C. Agardh in the Tigullio gulf, East of Genoa (44° 20' N - 9° 13' E) (PLEBE, 1998). At that time, this station was the North-Eastern expansion boundary of the algae in the Mediterranean Sea. In Italian waters, the first specimen of the alloctonous algae had been signalled in 1992 at Imperia (43° 53' N - 8° 01' E) (RELINI & TORCHIA, 1992). In 1996 the extension of *C. taxifolia* had been estimated to concern more than 1300 ha along the Italian coasts of the Mediterranean Sea (MEINESZ *et al.*, 1997); and in 1997 the area affected exceeded 2600 ha (MEINESZ *et al.*, 1998), following an exponential trend of diffusion (MEINSZ *et al.*, 1997).

The news about the presence of *C. taxifolia* in the Tigullio gulf (PLEBE, 1998) was reported to and warned the public of "the presence of the killer algae" and "the assault against it by the experts in coastal management'". The newspaper reported: "Although the scientific community has not yet come to an agreement, the algae is considered quite dangerous by some experts, who stress that it emits toxic substances which poison both fish and man". A few months later, in April, 1998, the same newspaper reported "the killer algae has been rehabilitated: it is not poisonous, it can eliminate the pollution" (TURITTO, 1998) and referred to the "ecological and financial scandal about caulerpa" which a French magazine had initiated (DUBRANA & JUBELIN, 1997). In Italy, owing to the lack of a continuous monitoring programme of the expansion of the algae, the confusion this controversial information produced characterised the public knowledge on the "caulerpa problem".

The international forum consider youth an important recipient of the educational curricula and public awareness programmes on the interaction between human development and the conservation of nature; youth will be the future users or managers of the environment (UNESCO, 1994). In school, the students complete their cultural background, which in the future, will allow them to enjoy and manage the environment. Several reports from the Italian

Ministry of Education suggested promoting environmental education in schools; developing interdisciplinary experiences that could enhance public awareness on environmental protection.

Recent psychological and pedagogical research stressed the transition from the objectivistic (BLOOM, 1956) to the constructivistic conception of knowledge, which is considered socially, historically, temporally, culturally and contextually constructed (DUFFY & JONASSEN, 1992). The practice of assimilating cultural procedures and instruments during experiments shared with contemporaries or adults, proved that it was encouraging a free and autónomous cultural background for students (VYGOTSKIJ, 1978). So the learning becomes a co-operational process which involves the capabilities of different subjects, like pupils, teachers, experts.

The spread of *C. taxifolia* along the coasts of the Mediterranean is a good case study for experiencing scientific education at school levels: this topical subject concerns the sea's environment, which plays a central role in the culture, economy and history of the coastal populations. The concept of danger inferred by the algae in distributed literature and the uncertainty about the consequences of its spread, excite the interest of the pupils. The debate which is dividing the scientific community allows for the enhancement of self-constructed knowledge.

## METHODS: PLANNING A LEARNING PROCESS ABOUT A CONTROVERSIAL ISSUE

In scientific education, the planning of a learning process which refers to the constructivistic theory will produce, in students, the awareness of the role of interaction with other subjects and negotiation and mediation in the construction of knowledge (VYGOTSKIJ, 1978). Group discussion is encouraged, with contemporaries and adults (the teacher, the experts); the foreknowledge, coming from former daily interaction with parents, teachers, people and media. The adults themselves will participate with the learning group, sharing their knowledge with students. The hypothesis on the scientific problem risen from the discussion, will be validated by some experiment, designed by the group of learners, to allow the inclusion of the knowledge in the disciplinary frameworks. The influence of the media on the cultural process must be explored to stress the importance of the technological and cultural instruments for mediated knowledge (OLSON, 1979). Misunderstandings and incomplete information are often the results of defective reporting by the media; the correction of the bias they produce in the cultural background of the learners is difficult (VYGOTSKIJ, 1978), but must be attempted to promote conscious behaviour.

The communication of the knowledge attained is a crucial phase of the process, during which the learning subjects re-organise the information to be transferred to (and to be understood by) other people. In this phase, the use of different languages points out the interdisciplinary nature of the culture and stresses that it is distributed by interpersonal exchanges (OLSON, 1979).

Several methods have been proposed to verify the effectiveness of the learning process. Between them, the concept maps (NOVAK & GOWIN, 1984) combine the control of the educational process with the evidence of the significance of the knowledge, forcing each component of the learning community (students, teachers and experts) to reflect upon the contents and the structure of his own culture. The map points out the hierarchical connections between the concepts composing the knowledge.

Controversial issues are very useful in the planning of a learning process. They force the subject to approach a problem without pre-conceptions, following a flexible pattern of reasoning. The working hypothesis, proposed by the learner, is evaluated by a reflective practice; to promote a free approach to the environmental problems. This encourages the capability of the students to solve new problems and to face new situations (TOBIN, 1993).

The project we discuss involved a class of the "Scuola Media Statale C. Durazzo" (a secondary school in Genoa; students age: 11-14 years) during the years 1996-1998 and a class of the "Scuola elementare statale N. Fabrizi" (a primary school; students age: 8-9 years) during the year 1995-1997. The interest in the spread of *C. taxifolia* in the Ligurian Sea lead the students of both schools to collect bibliographical information produced by the media (newspapers, magazines and television). Great confusion arose from reading varying reports on the same subject, so the learning groups sought marine biology and didactic experts to obtain the "true information" about the ecological problem. A learning process was planned to perform the construction of an autonomous and free understanding of the facts by the students. The constructivistic theory was the reference background for the project. In the first phase, the plan forecasted: a) the collection of information from the media; b) its group discussion both with contemporaries and with adults; c) the proposal of working hypothesis; d) their experimental validation; e) the transfer of the acquired knowledge to the public by some kind of report (PILO & DE PAZ, 1999). The students of the secondary school arranged the information collected from the media by producing a report, while the primary level pupils produced a theatre performance. The analysis of both the documents did not solve the doubts the youth had on the impact of the algae in the Mediterranean Sea. To supply less biased and more detailed information, in the second phase of the project, we proposed analysing some scientific reprints dealing with the caulerpa problem to the groups (DOUMENGE, 1995; GIACCONE & DI MARTINO, 1995; MEINESZ & HESSE, 1991; RIGGIO, 1995, SANDULLI et al., 1995; VERLAQUE, 1994). The reprints have been chosen as representative of two different scientific evaluations of the caulerpa problem; the first (Doumenge, Giaccone, Riggio) considers the expansion of the algae in the Mediterranean Sea as the consequence of the lessepsian migrations through the Suez Channel and the survival of the seaweed populations of Thetis in the Eastern basin. The second (Meinesz, Verlaque, Sandulli) pays attention to the ecological impact of the exponential expansion of the algae, stressing the need for a control method which could allow the reduction of the damage caused on the original sea community.

The disagreement existing in the scientific community (reflected in the number of reprints supplied to the students) gave rise to the process of the construction of the groups' own opinion. The visits to the Aquarium of Genoa, in which *C. taxifolia* is exhibited, and to the seashore supported this phase of the project. A concept map about *C. taxifolia* (Fig.1) has been drawn by the secondary level class, ranking in a descending inclusive order the concepts arising from the knowledge of the students and linking them in simple sentences. In the final phase of the project, the UNESCO "Heraklion conclusions and recommendations" (MEINESZ *et al.*, 1998) supplied to the secondary level learning group the present discussion about caulerpa, showing the effort of several nations facing the Mediterranean Sea dealing with the problem starting from a shared knowledge and with common aims.

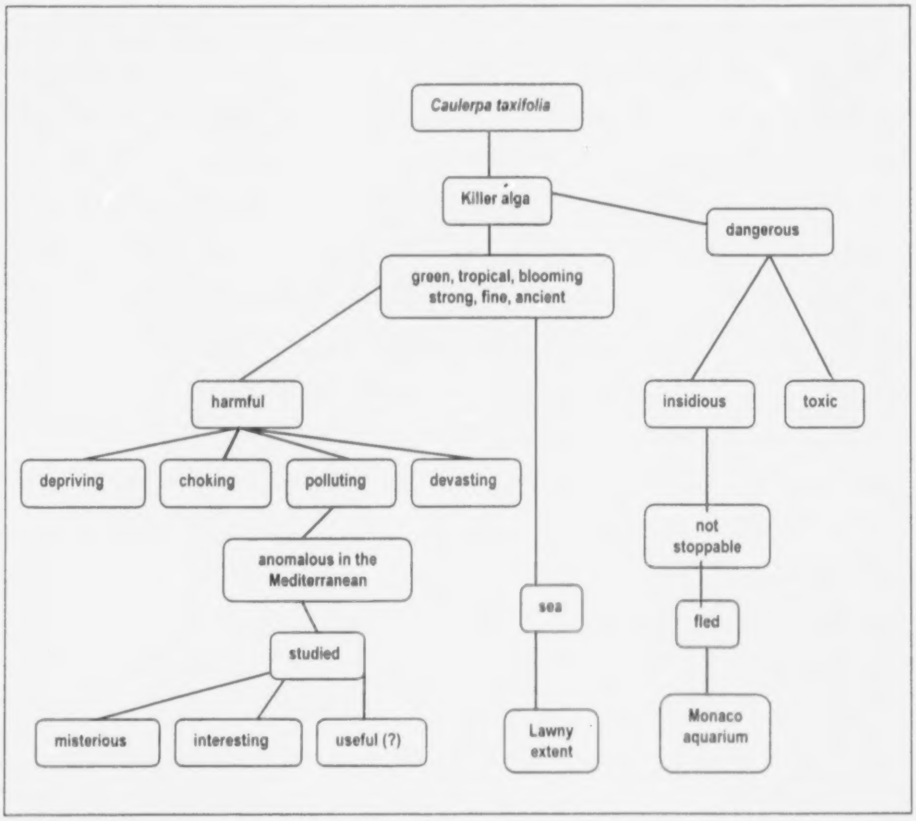
*Caulerpa taxifolia*
Killer alga
dangerous
green, tropical, blooming strong, fine, ancient
harmful
insidious
toxic
depriving
choking
polluting
devasting
not stoppable
anomalous in the Mediterranean
sea
fled
studied
misterious
interesting
useful (?)
Lawny extent
Monaco aquarium

Fig. 1: concept map of knowledge on *C. taxifolia*.
Students of the secondary level class.

## RESULTS OF THE LEARNING PROCESS

In a science education experiment, the main results can be recognised in the cultural background of the learning group. Constructivism states that the learning subject builds himself up with knowledge; so the central aim of the process we present is the construction of a self made opinion on the controversial problem discussed. In the following paragraphs (*in italic style*), we present the contents of the report wrote by the secondary level students or of the theatre script from the primary ones, to allow the reader to experience their learning process. Describing the first phase of the work, the secondary level pupils wrote:

> *We started collecting information by reading articles in magazines and newspapers, but we soon realised that they did not agree with one another. We thought that a biologist could tell us how things really stood; instead, he suggested that we should read some scientific reprints* (see above) *written by other scientists, discuss the problems with him and try to make our own conclusions. It was exciting to enter the world of science. We discovered that there is a minority of scientists who say that the spreading of caulerpa is dangerous for the Mediterranean. We did not imagine that the researchers were still discussing the causes and effects of the problem, without finding a common agreement. It was difficult to build up our own idea about the presence of the killer algae in our sea: it is easy to be misled by what one reads. It is difficult to be well informed. We discovered that where caulerpa is present, the other species disappeared. We read that it does not seem toxic for all marine organisms, and we decided that it would be better to increase our research about its toxicity. We were surprised at its speed in spreading on the sea bottom; the biologist showed us the various methods used (without success) to stop it. Some of us suggested waiting for some years to see what would happen, but we have noticed that it keeps on spreading along the coast. We also asked ourselves if it would be as dangerous in surroundings with no life forms, as in a port, but some of us said that from the port it could spread into other surroundings. To better understand this algaeand its method of occupying the marine bottom, we did some field research on the beach and visited the Aquarium of Genoa, where C. taxifolia is kept."*

On the other hand, the script of the primary level pupils is the result of a former knowledge experiment on the marine communities of the north-western Mediterranean Sea. During that experiment, the sea grass meadows attracted the curiosity of the students, who knew from the media that the so called "killer algae" was threatening the underwater prairies. So, the script tells about the disturbing appearance of *C. taxifolia* in the stillness of a sea grass meadow. The youth imagine the algae as a cunning and fighting species that wish to become *"the queen of the sea"*. The terrible battle stops at sunset, and during the night the few surviving species of the meadows call for the old octopus' help. In the fantasy world of children, only magic will solve the ecological problem: the controversial information collected from the media didn't supply them sufficient knowledge to propose a more scientific solution. But their curiosity was not satisfied; so we proposed to them a summary of the scientific information contained in the above mentioned reprints of DOUMENGE (1995), GIACCONE & DI MARTINO (1995), MEINESZ & HESSE (1991), RIGGIO (1995), SANDULLI *et al.* (1995) and VERLAQUE (1994). After critical discussions, the pupils proposed some corrections to the conclusion of the theatre script: resuming the opinion that caulerpa is a species capable of remedying a polluted environment; someone proposed a final round table between the marine species, discussing the integration of the algae in the local community. Another, observing the competitiveness of the algae and its toxicity to some marine species, proposed a drastic scenario in which all the marine species are replaced by caulerpa. The pupils suggested that the new prairie could generate a new habitat, supporting the presence of the species which formerly disappeared due to the pollution.

Also the secondary students presented their opinion on the caulerpa case:

> *"This year, after the biologist brought us up to date on the spreading of C. taxifolia and the research on the algae, we tried to draw our own conclusions.*
> *For us the caulerpa problem is not one to be ignored: it is still difficult to know if the spreading of the algae will stop; the researchers themselves aren't in agreement and the methods used till now to fight it have proved almost useless. We agree that its presence causes the disappearance and suffocation of many species (both animals and plants) on the sea bottom, damaging the environment. Fortunately, it is not toxic for man and for many species that live in the sea. Even though it seems clear that it has been introduced in the seawaters in front of the Monaco Aquarium, some of us think that it is wrong to try to find who is responsible for its presence. We have understood that it is an algae that has been modified by man to embellish some artificial environments, such as fishponds, and these alterations have become a problem when caulerpa has entered the natural environment. We were sorry to learn that in Italy it is still possible to buy C. taxifolia in shops which sell equipment*

*for aquarium: some bits of the algae could have been dropped somewhere into the sea, speeding up the spreading of the algae along our coastline.*

The discussion preceding the draft of this final part of the secondary students' report allowed us to construct the concept map of the knowledge of the pupils. The map summarises the results of the learning process carried out by the group, allowing it to estimate the effectiveness of the project and its impact. In the map (Fig. 1), "killer algae" is the most inclusive concept connected with *C. taxifolia*, showing the deep impact of the media message to the inexperienced public. This concept is more important than "green algae" or "polluting" element; the "pollution" concept is included in the harmfulness, which, in the culture of the students, is a typical feature of this "blooming" algae. The pollution concept includes the "anomalous" presence of the seaweed in the Mediterranean and the interest for research on its spread; a member of the group proposed the study of its possible usefulness for future research. The "danger" of the "unstoppable" expansion of caulerpa and its "toxicity" is a more inclusive concept, directly connected with the "killer" nickname of the alga. Its "unstoppable" expansion and "toxicity" are considered by some members of the group, to be more important than the identity of the entity which discharged it into the Mediterranean.

## CONCLUSIONS

The essential problem of scientific education is not only to improve the understanding of disciplinary concepts and to prepare new scientists and technicians, but also to foster in the public the ability to screen the information from the media and to participate consciously in the decisions on the use of environmental resources and the results of scientific and technological knowledge.

In Italy, because of the lack of a continuous research programme, the media played a heavy role in the transfer of information to the public; an incomplete report by media personnel often caused great confusion in readers. So, the sensitisation of the large public about the spread of *C. taxifolia* becomes one of the crucial purposes of the projects monitoring this ecological problem.

The learning process we proposed to the students supported the disciplinary curriculum of the classes, allowing them to experience the scientific method and to construct knowledge, which was significant for the learners themselves. The discussion on the evidence of the differences arising from the comparison between the scientific reprints and the media, promoted an awareness learning in both groups.

The analysis of the concept map of the final report, prepared by the secondary students and of the corrected theatre script of the primary ones allowed us to verify the positive impact of the process on the knowledge of the students. Some basic ecological concepts have been deeply understood: pollution implies that an anomaly happens in the system, and is directly linked with the concept of harm. The danger for the expansion of *C. taxifolia* along the Mediterranean coasts implies difficulty in its control. The nickname "killer algae" is related to the seaweed as a linguistic definition; its meaning is connected more with the disappearance of other marine species in the affected areas than with its toxicity. During construction of the map, both the teachers and experts involved in the project had to organise their knowledge, before imparting it to the group.

Any further considerations about the project can be well summarised by the conclusions drawn by the students themselves; one of the opinions of the primary pupils is:

> *"If we can detect that caulerpa chokes the sea grass, we should find some method to eliminate it. It is necessary, however, to take care and to understand whether the killer of the sea grass is the algae or man polluting the sea. Every one of us can offer some money to allow the scientists to do more research on the algae and its dangers."*

The secondary group reports:

> *"We were very interested in this problem because we love nature and we do not like to upset the balance of an environment so rich, fascinating and singular as the Mediterranean Sea. We will always endeavour to respect it and pass on our feelings to future generations."*

## ACKNOWLEDGMENTS

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## REFERENCES

- Bloom B.S., (1956). *Taxonomy of Educational objective*. McKay Company, New York (USA).
- Bowman M., (1998). *Reporting on scientific Issues. Science Link,* Canada , 18 (3). (http://www.interlog.com).
- Doumenge F., (1995). *Quelques réflexions sur les algues caulerpes*. Biol. Mar. *Medit.,* Italy, 2 (2): 613-633.
- Dubrana D. & Jubelin F., (1997). *Les bonnes affaires de la caulerpe*. Science et Vie, France, 963: 15 pp.
- Duffy T.M. & Jonassen D.H. (eds.), (1992). *Constructivism and the technology of instruction*. Erlbaum Ass. Publ., New Jersey (USA).
- Giaccone G. & Di Martino V., (1995). *Le Caulerpe In Mediterraneo: Un Ritorno Del vecchio bacino tetide verso il dominio indo-pacifico.* Biol. Mar. *Medit.*, Italy, 2 (2): 607-612.
- Meinesz A., Cottalorda J.-M., Chiaverini D., Braun M., Carvalho N., Febvre M., Ierardi S., Mangialajo L., Passeron-Seitre G., Thibaut T. & De Vaugelas J., (1997). *Suivi de l'invasion de l'algue tropicale Caulerpa taxifolia devant les cotes francaises de la Méditerranée.* Situation au 31 Décembre, 1996. Ed. Laboratoire Environnement Marin Littoral, Université de Nice-Sophia Antipolis, France: 190 pp.
- Meinesz A., Cottalorda J.-M., Chiaverini D., Cassar N. & De Vaugelas J., (1998). Suivi de l'invasion de l'algue tropicale *Caulerpa taxifolia* devant les cotes francaises de la Méditerranée. Situation au 31 Décembre, 1997. Ed. Laboratoire Environnement Marin Littoral, Université de Nice-Sophia Antipolis, France: 238 pp.
- Meinesz A. & Hesse B., (1991). *Introduction et invasion de l'algue tropicale* Caulerpa taxifolia en Méditerranée nord-occidentale. Oceanologica acta, France 14 (4): 415-426
- Novak J.D. & Gowin D.B., (1984). *Learning how to learn*. Cambridge University Press, Cambridge (UK).
- Olson D.R., (1979). Linguaggi, media e processi educativi. Loescher, Italy.
- Pilo M. & De Paz M., (1999). "Open schedules for environmental education." In: *European Project for environmental education*, M. De Paz & M. Pilo (eds.),. Il Gioco della materia e delle idee, 2 (suppl.), Genova (Italy):143-147.
- PLEBE A., (1998). *Allarme sub nel Tigullio.* Il Secolo XIX, Genova (Italy), 30/1/1998.
- Relini G. & TORCHIA G., (1992). *Prima segnalazione di* Caulerpa taxifolia in acque italiane. *Doriana*, Italy, 6 (279): 1-4

- Riggio S., (1995). *Il caso delle caulerpe: immigrazioni recenti e parallelismi con le invasioni di terraferma nell'area mediterranea.* Biol. Mar. Medit., Italy, 2 (2): 593-605.
- Sandulli R., Morucci C., Tripaldi G., Cinelli F., Proietti-Zolla A., Benedetti-Cecchi L. & Della Pieta F., (1995). *Distribuzione dell'alga tropicale Caulerpa taxifolia nelle acque italiane: situazione al dicembre 1993. Biol. Mar. Medit.*, Italy, 2 (2): 409-410.
- Tobin K. (ed.), (1993). *The practice of constructivism in science education.* Erlbaum Ass. Publ., New Jersey (USA).
- Turitto A., (1998). *Riabilitata l'alga assassina. Il Secolo XIX*, Genova (Italy), 2/4/1998
- UNESCO (Ed.), (1994). *Innovations in science and technology education.* Vol.5, Unesco, France
- Verlaque M., (1994). Le développement de l'algue *Caulerpa taxifolia* en Méditerranée. *Les Entretiens de Segur*, France, 21/3/1994: 15 pp.
- Vygotskij L.S., (1978). *Mind in society*. Harvard University Press, Cambridge (MA)

TEND 2000

## Crossroads of the New Millennium

# Transformation Of Information Technology Into Information Resources In The 21st Century In The GCC

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## Poster Presentation

# Abstract

Information and knowledge-based resources have been recognised as major ingredients for national development as we are in the 21st century. In principle, all the GCC countries acknowledge the importance of information by adding it as a new programme along with other major national programmes. Information resources and information technology leading to network is a blessing for the GCC countries, having very advanced and reliable telecommunication system. But the major problem is absence of national or regional network planning. Today, an explosion of information is occurring, and it is being fuelled by advanced communication satellites, fibreoptic cables, supercomputers, and other technology. It would appear that information for development has become one of the most pressing issues of the last decade, which GCC countries has to tackle on urgent basis. H.H. Shaikh Zayed bin Sultan Al Nahayan, rightly proclaimed that for national development training of nationals is a key element. Under the continued guidance of H.E. Shaikh Nahayan bin Mubarak Al Nahayan higher education development has enhanced to fulfill that vision for national educational development in UAE.

Even with the best available interactive videoconferencing technology in the world, backed up with full E-mail and Internet capabilities, we still require a strong element of person-to-person contact for the educational process to work. At a time when the global employment situation remains grim in most countries, the quickening pace of globalisation and technological change offers challenges and opportunities. Yet a country's ability to take advantage of those opportunities, and thereby minimise the social costs of a more open economy, depends at least partly on the level and quality of the skills it possesses with nationals. KISR in Kuwait, KACST, Research Institute at King Fahad University of Petroleum and Minerals both in Saudi Arabia and CERT in UAE are the four major R & D centres of international standard in the GCC countries. It would be more beneficial for all the major R & D institutes like KISR, KACST, GOIC, ESSR, Research Institute (KFUPM) and CERT to form a consortium to avoid duplication and share knowledge management based on information network proposed by me for national and regional development. The major challenge for all educators will be to remain open and humble enough to realise that we are no longer able to teach in the traditional sense of the word. We must break old educational paradigms, provide the resource and wisdom basics, and to act as guides for our students as we all learn together for national, regional and international development.

# Transformation of Information Technology into Information Resources in the 21st Century in the GCC

In 1980's, among developing nations the fear that they were becoming increasingly dependent on industrial countries for information and technology prompted them to increase their efforts to organise their own national information systems. Furthermore, international and regional organisations, both governmental and intergovernmental, have become more concerned with the growing information gap between the more and less developed worlds, and have increased their efforts to help the latter improve to generate and handle information. It would appear that information for development has become one of the most pressing issues of the last decade, which GCC countries has to tackle on urgent basis.

Higher education in the GCC countries has undergone tremendous growth and diversification from 1980's to the turn of the century (more recently in the private sectors). The unparalleled growth of academic/national research libraries and information in the Gulf Co-operation Council (GCC) countries received an extraordinary boost in the last 20 years. Petrodollars were channelled to build indigenous information capability. GCC countries are now in the process of formulating information policies based on rapid industrialisation following the western pattern of development in the 20th century.

Information has often been described as the life-blood of progress for a country. National policy of information technology for information resources is a necessity. This must go hand in hand with a national information policy. Implementation of these policies must rest with the statutory bodies responsible for development or with the statutory body responsible for the development of information systems throughout the nation.

Technology according to Bush (1981) is a form of human activity that applies the principles of science and mechanics to the solution of problems. It includes the resources, tools, processes, personnel, and systems developed to perform tasks and create immediate particular, and personal and/or competitive advantages in given social, economic, and social context. From the literature review I delineate three meanings of technology assumed in popular and academic discourse: technology-as-instrumentality, technology-as-industrialisation, and technology-as-novelty. Unfortunately last definition is highly favoured in the GCC context. Every senior-level executive responsible for information technology within an organisation struggles with information overload.

Technological innovations and new product developments occur almost too rapidly to follow. Sifting through the massive amounts of information produced by vendors and experts in order to make informed decisions is becoming almost difficult if not impossible. Technological paradigms are changing. By the time one technology is firmly understood, another replaces it. At a time when the global employment situation remains grim in most countries, the quickening pace of globalisation and technological change offers challenges and opportunities. Yet a country's ability to take advantage of those opportunities, and thereby minimise the social costs of a more open economy, depends at least partly on the level and quality of the skills it possesses. Today, an explosion of information is occurring, and it is being fuelled by advanced communication satellites, fibreoptic cables, supercomputers, and other technology. Society has moved well beyond Teilhard's "Noosephere" to what may be called the "Technosphere". Many scientists and others would suggest that the resulting technocratic society is desirable, just, and ultimately good.

I will limit my presentation in the framework of the following two main theses.

a) Are academic/national research libraries and information centres procure pertinent information resources in all the cases to enhance the research and development activities in science and technology in the GCC countries leading to national development?
b) Is there a need for the establishment of a science and technology information network in GCC countries on a regional co-operative basis with a distinct National Information Network (NIN) with the enhanced information technology now available for national development?

Some experts focus on the importance of international co-operation and co-ordination of information services in solving the problems of scientific and technical information in developing countries; others emphasise the importance of information technology and its application to information processing. The effective participation of a country in the development of information systems and networks at a regional or international level depends on the existence of a strong internal information infrastructure.

In the GCC perspective Information policy directed by the government to co-ordinate all matters concerning the organisation and dissemination of information, than there is general agreement that no such strategy currently exist. Individuals and societies are constantly bombarded by information. So, the problem is not one of information shortage but one of finding better ways to access filter and use the available information. This suggests the need for efficient management of the information sector, on a national scale. Governments of the various countries, industrialised or developing countries have been concerned with the co-ordination of the national information services, aiming to organise their information services on a national bases to satisfy their citizen's information needs. In this sense, Montviloff, (1990, p. 87) considers that: it is expected that the integration of an information policy into the national development policy will result in a wider acceptance of the strategic significance of information services and their managerial implications for businesses and national economies. This evolution has made access to information faster and easier, but it has also contributed with the appearance of several problems in areas such as transborder data flow, data protection, copyright of information and technology transfer. UNESCO (1985) considers that one of the reasons for the existence of national information policies has to do with the need to formulate strategies that enable the information society to reduce the inequalities that exist in the world. This aspect is valid if we accept the idea that access to information is a source of power and that those that have access to information are information rich and those that do not have access are information poor. If a country needs to promote the effective flow of information in society, the formulation of an information policy may be a starting point in the process. Conversely, the information policy may also appear as a mechanism to introduce some constraints in the information flow. The document National Information Policies (Hill 1989,p.5) considers all the issues necessary for the formulation of information policies.

As the 2000 was approaching (much to the terror of many information technologists confronting with the " Millennium Problem ", which even dignitaries like Bill Gates personally confirmed with me at the American Library Association Meeting at San Antonio in mid January 2000. H.H. Shaikh Khaled Bin Zayed Al Nahayan, supported Y2K Challenge Award, so that the GCC technology investments will allow this region in to 21st century globally as an undisputed leader in the world of Information Technology was a very wise decision. It is only natural that we were all eager to peer into the crystal ball of the new millennium, as the year 2000 presented a clear, if somewhat artificial, demarcation point of the " now " and the " future " (at least until 2001 when we begin another odyssey). It also gives a focal point on which to "look back" at where we have been and how we have arrived where we are on this millennium. At least we are not so static with the generation at the end of 1890's predicted, that there won't be any R & D, invention and discoveries in the 20th century, in contrary what a dynamic century we had.

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The need and urgency for planning national information systems have been clearly pointed out in several international conferences. Planning national information systems is a continuing and complex process, which has no easy ready-made formulas, which could be completed in a short time frame. In literature almost all the studies were based either on resources or services, however in author's doctorate thesis attempt was made to study both the Information Resources and Information Services as a dual focal points to develop a regional and national information system using information technology for national development. The study led to establish base for National Information Network (NIN) and GSTIN (Gulf Scientific and Technical Information Network), which is open for discussion to implement for the national development in the GCC countries.

## METHODOLOGY

GCC academic/national research libraries and information centres form part of this study. Since the application of information technology into information resources is in infancy in the GCC, there is limited number of accomplished examples available; therefore, qualitative research method was used. An up-to-date questionnaire was posted at Arab Gulf Special Library Association conference (1998-99) in Bahrain, with follow up group face to face interviews in Bahrain or by e-mail concurrently with academe's and information providers from all the six GCC countries. However, the major section of the study about Information Services is not included here, which is to be published as a part of a chapter in a forthcoming book edited by an international scholar in mid 2000.

## INTERNATIONAL INITIATIVES

UNESCO in collaboration with other international organisations has sponsored many international seminars, including the UNESCO Expert Meeting on National Planning Documentation and Information resources Services. The Final Report of UNESCO's Intergovernmental Conference on the planning of National Documentation, Information resources and Archives Infrastructure, outlines sixteen objectives for transforming into action the idea whose acronym NATIS stands for national information system in action. The NATIS concept implies that the government, national, state or local, should maximise the availability of all the relevant information thorough documentation, information resources and archives services, and it takes responsibility for the basic education at primary and secondary levels of its citizens for national development.

Trigo, Correia and Wilson have done the literature review of information society for national development in the national context very diligently

In Gray's opinion "...the proportion of information - requiring and information - handling work has been growing rapidly, is now substantial and looks like growing even further" (Gray 1988, p. 2). Under this view, information is perceived as a resource that allows us to exploit other resources more efficiently. Information is seen as possessing great strategic value in the decision - making process, economic and social development and in education and training. (Trigo et. al. 1996, p.220)

Wilson (1990,p.29) considers that, due to the difficulty in defining the information concept and also to the complexity of the idea of information as an economy sector, "it is not surprising that the idea of a national information policy is also difficult".

Several reasons may be considered as providing the bases from the formulation of national information policies. In some countries, the problem consists of enabling and promoting the free exchange of information; in other situations, the information policy aims to limit the transnational exchange through the use of barriers e.g. legislation.

## REGIONAL PERSPECTIVE

The quality of information produced in the GCC countries are not yet up to the standards of accuracy and reliability required for national and responsible analysis and planning decision making for national development. A reasonable number of independent research centres have not been established at regional and national levels, the research being done has not yet been institutionalised except in a few cases. It is difficult for scientists to secure funds for pure research activities. In GCC countries institutes of higher education are being established because a high priority is now attached to science and technology education, (a vivid example is UAE where number of new universities developed in the last five years: compare to one just close down) recognising that this contributes directly to the economic well-being of a country. Universities development in UAE might lead this area a centre for international learning like Cambridge-Boston in USA. Regionally King Fahad University of Petroleum & Minerals (KFUPM) and Kuwait University (KU) in the academic area and Kuwait Institute of Scientific Research (KISR) and King Abdel Aziz City for Science & Technology (KACST) and CERT are institutions/organisations of international standing which are located in GCC countries. In certain GCC countries, the Chief Executive in the country oversees the interests of science and technology development.

In the GCC, Saudi Arabia have only organisational structures that assist in the formulation of National Science and Technology policy. In addition to KACST, Inter-University Supreme Council formulates policies for the university system in Saudi Arabia which includes all scientific research activities. The Ministry of Planning is responsible for planning and developing science and technology programmes in the country.

KISR's could be a good starting basic model, whose overall objectives are "to promote scientific and applied research and information development". Adherence to these objectives has led to the promotion of indigenous technology, the facilitation of the transfer of technology, the development of human resources in science and technology and financial and institutional support for scientific research rebuild by highly educated Kuwaitis.

CERT in UAE has established a series of joint-venture partnerships and relationships to provide a wide-range of world class technology and business solutions. Through its international contacts, CERT can offer a solution for virtually every training, education, and business need. The programmes at CERT are very unique and comprehensive for national development, which has to be pro-active and targeted. Therefore a comprehensive cost effective market plan has to be implemented, so resources and services could be provided on national/regional level to avoid any further wastage. Recently Ajman University of Science & Technology hosted an international conference on "Interactive Communication and Electronic Commerce", and under the wise leadership of Dr. Saeed Salman several innovative IT projects are underway, as well as support for regional higher education development.

At KACST the General Directorate of Information Systems support research and development by providing appropriate information to engineers, researchers, and experts in the Kingdom through on-line searches from its own databases and from selected foreign databases.

1. On-going research projects
2. Arabic bibliographies
3. Manpower
4. KACST-funded projects

KACST's responsibilities involve developing many projects and conducting many studies that are important to the country's development.

Although the initial question on information availability focused on specific standards that could be adopted for collecting information needs for development. This "top-down" approach, generally viewed, involves assessing information needs in each sector by taking into account the forms and types of information resources, the levels and categories of information users, and the purpose and functions of information in supporting specific needs.

United Arab Emirates has continued to secure number one position in GCC countries regard to the number of Internet users with record 160,000 users, followed by 85,000 in Saudi Arabia. Then come Kuwait 70,000, Bahrain 50,000, Qatar with 40,000 and Oman with 35,000. The total number of Internet among users among the GCC countries is 400,000 users. Sources in the computer companies expect a big increase in coming period in the number of Internet users, because of the wide spread of e-commerce, which will become the language of the future and the means of communication in the market during the few coming years in addition to the role the Internet is playing in the exchange of information and e-mail. With strengthening the role of the Internet is the availability of economic services such as presentation, shopping and marketing of goods and services. In addition to education, colleges' sites happenings of the market, stock exchange and corporate management. It is expected that the volume of e-commerce in the Arab world would be around 95,000-100,000 million dollars in the year 2001, with UAE playing a leadership role, with a percentage growth of 140% and the volume of international trade in the Internet is expected to reach 200 billion dollars.

## NATIONAL INFORMATION RESOURCES SYSTEM BASED ON INFORMATION TECHNOLOGY

The framework for national information system comprises of five entities. The first three components, which cover the information resources, information services, and information technology, which represents the major components of the national information, model system. The fourth component of human resources and the fifth the national co-operative plans which is necessary due to the limitation of R & D production and human resources at universities and S & T research institutes in all the GCC countries.

The following major components of the strategic approach model derive the information plan system strategy on the national level, which is, suppose to interlink closely. However, in the GCC context all the components are active independently, which could deter the national development.

a. **Information Resources**

To select, procure and organise information resources in science and technology in a cost-effective manner to serve at national level.

b. **Information Services**

To promote and disseminate consistent and prompt information, exploiting information networks at local regional and international levels of all types and forms with adequate facilities.

c. **Information Technology**

To activate an automated system exploiting the contemporary information technology and co-operative information resources networking using multimedia.

d. **Human Resources**

To stimulate users to be self-sufficient and elevate the skills at national LIS to exploit national information resources and technology in the most effective and efficient manner through educational training programme.

e. **National Co-operative Plan**

To design the national information policy in science and technology at national levels for effective decision by providing a framework to evolve and execute co-operative national projects and programmes.

Information resources and information technology leading to network is a blessing for the GCC countries, having very advanced and reliable telecommunication system. But the major problem is national or regional network planning. This problem has to be rectified before a national or a regional network can work. Another major drawback in GCC context is the total in-consistency in human resources and national development. There is an urgent need for strategic planning sector by sector with deadlines to be implemented.

Gutenberg's invention of the printing press represented the first freeing of the general population from the tyranny of education of elite's. The Internet has furthered this freeing by bringing information into the hands of everyone who has access – although not yet equal access – to a reasonable public education system.

i. Language difficulties

ii. Difficulties of a psychological or intellectual nature - the presentation of information

iii. The "pollution" of information--not in perfect condition

iv. Legal and administrative barriers hindering the flow of information across national borders.

Currently in most of the GCC countries, the information resources look very much different from the past two years. Campus wide networking of Open Public Access Catalog (OPAC) and CD-ROM searching, full-text databases, prompt and low-cost electronic document delivery services have proved an invaluable vehicle to extend campus wide information resources services successfully, and to convince the information patrons that the information technology (IT) resources offers "total solution" to their information resources demands. The first initiative in this area was taken by KFUPM.

Advances in computer and information technology facilitate the speed and force of the trend toward decentralisation, and that trend, in turn, has a dramatic impact on the way those technologies are being used in the field of information resources, automation and networks. Information technology is seen as a panacea for many information resources ills but there are considerable of information resources altogether, accustomed to electronic information and retrieval additional or alternative sources of information, thus Information Technology solves many services problems, in academic and science and technological information resources.

As a result of the growing use of computers and continuing improvements in information communication technologies, there has been an accelerating growth of information resources and information services. In the past two years, for example, networking was absent from the branch libraries, OPAC terminals were few in quantities to serve campus-wide users, CD-ROM databases development was in the beginning stage as stand-alone system, and document delivery service was using a normal mail via the British Library & Document Service (BLDS) department. Thus the university information department was providing its IT services locally and users used to come to the central information department searching for required materials. Today the development of the desk top work stations, coupled with an effective campus wide networking is increasingly offering academic staff and students the opportunity to exploit Information Technology (IT) from anywhere in the campus. Consequently, the central information resources have put its services in the position to meet this changing requirement.

DOBIS/LIBIS, VTLS and Horizon plus CDS/ISIS systems are mostly used to automate major information resources functions in the GCC countries including Arabised versions. Recently, new network enable users to access information resources materials from anywhere on-campus by terminal or by PC from home with Modem via telephone line. The development of network between three universities (KAU, KSU, and KFUPM) to access the OPAC system is a good initiative. A good news from KAU information resources is that it has added Arabic periodicals to the system and first time Arabic periodical holdings are available online under OPAC system at any university. It would be good for HCT, Zayed and other UAE universities to join hands to form network consortium to share national information resources for which they have to have similar automated system, which is unfortunately is not the case at the present time. With catalogues on Internet the problem has been solved instantly which the GCC countries were trying to tackle for the last twenty years. An on-line computer communication network system (GULFNET) for the GCC states is already operational, with big question mark for its operation.

KACST and KISR took the lead in developing information knowledge management manpower, for e.g. KACST initiated, which could be followed by CERT.

1. Developing manpower by employing students and training them in conducting workshops in USA as well as inviting many scholars in information science to visit the country and give lectures or contribute to workshops.
2. Encouraging librarians and information specialists in the country to achieve complete policy for co-operation between libraries and information centres in information sharing.
3. Establishing a national computer network, which links many libraries and information centres at national level.

Arrangements will have to be made for training staff already employed by the information resources in working with the new utilisation. (Computer courses are after all very popular in the GCC so the information technology aspects of information resources work might attract more able candidates to the profession). It is sad to observe that even after 12 years establishment of HCT Learning Resource Centres, even LRC technicians are recruited from the west, who are just high school graduates with technician's diploma. The assumption is that highly paid LRC management from the west not able to train local personnel in ten years locally or national level in UAE. In contrast with manpower development programme in Oman the presenter of this session was able to co-ordinate training programme from year one and many LRC specialist were trained within three years to take over LRC information resources/services departments. Unfortunately UAE is the only GCC country without an academic programme for LRC/Library personnel and again highly paid consultant at UAE University took no initiative. The author has developed LRC programme open for discussion and deliberation with the management of higher institutes in UAE, which is both traditional classroom delivery and web based fully IT/multimedia based needed for the 21st century. But we have found that even with the best available interactive videoconferencing technology in the world, backed up with full E-mail and Internet capabilities, we still require a strong element of person-to-person contact for the educational process to work.

Technological advancements are changing the role of teacher to that of educator. Management sage Peter Drucker has confidently predicted the demise of the university within 30 years. Drucker is dead wrong, for a number of reasons, including 1. Educators will be able to use technology to develop exiting, high-impact learning experiences, but they will not be replaced by it. 2. The proliferation of information now available has created a need for excellent educators. If caring about students is prerequisite to motivating them to learn then technology alone cannot do the job. Without a doubt, technology will replace teaching that merely conveys facts. The real value of education is not in what one learns, but in how one develops. This development requires social interaction. Technology has enabled us to reach out to more people who could never have taken a programme such as ours – people who may be unable to take the time to return to school or, indeed must somehow integrate their education with their workplaces, Using affordable, studio-quality videoconferencing has allowed us to offer our highly interactive, casebased programmes in both "high-tech" Videoconferencing (mini-studio) and "low-tech" (classroom) modalities.

The most prominent national science and technological institutes / organisations in the GCC are KACST in Saudi Arabia, KISR in Kuwait and CERT in UAE, basically based on the model developed by the Research Institute of the King Fahad University of Petroleum and Minerals (originally University of Petroleum and Minerals (KFUPM), where the speaker was instrumental in developing both national and international information projects.

Information resources and information technology leading to network is a blessing for the GCC countries, having very advanced and reliable telecommunication system. But the major problem is national or regional network planning. A well-organised national CD-ROM network plan could be developed leading to a regional plan, because the subscriptions for the CD-ROM are still very expensive or with recent Internet connections the door of CD-ROM usage is open by them.

KISR in Kuwait is pursuing integration of networked information resources into information services, a measured process of systematic research and strategic planning is progressing since 1991 pursuing an aggressive programme of automation to introduce electronic information provision into NSTIC operation and services which enhanced information services and staff expertise inspite of both financial and staffing constraints, where I was active as Strategy Team Member.

The National Information System should be responsible for:

1. Provision of national information services to meet the present needs of users, generators, processors and disseminators of information.
2. Optimum utilisation of existing information services and systems and the development of new ones.
3. Promotion of national and international co-operation and liaison for exchange of information.
4. Support and provide active encouragement for the development of facilities for education and training in information science and technology.
5. Support and promote research and development and innovation in information technology.

In the joint interview and follow up e-mail correspondence was based on the following two queries:

The first is the question of whether there was a need for a national / regional information policy and the second is related to information availability, accessibility, and utilisation.

Initial reflections often focused on whether a national information policy was necessary for the GCC countries. Some individuals suggested that country like Saudi Arabia be in a unique position that may not be shared by other countries. Taking all this into consideration, and assuming that information is as indispensable a component of development as any other, several participants asked whether information services is parallel what the GCC countries has achieved. Many felt that despite recent development in the field, information services in the GCC has not experienced the same rate of development as other sectors. It is difficult to think of a form of information service not being offered in the country. Returning to the initial question, almost all those interview felt the urgent need to formulate a national and or regional information policy for the GCC. Further the policy should reflect the increased need for effective collection, organisation, and use of information.

Although the initial question on information availability focused on specific standards that could be adopted for collecting information needs for development. This "top-down" approach, as one individual viewed it, involves assessing information needs in each sector by taking into account the forms and types of information resources, the levels and categories of information users, and the purpose and functions of information in supporting specific needs.

Another issue raised during the interviews related to the structure of information distribution and dissemination services. As one respondent indicated, most large information systems in Saudi Arabia are located in one region (Central region) and due to the lack of effective distribution and dissemination mechanism in the country, there seems to be a geographical distance between the products and services of systems and potential users. This problem in fact raised two issues. One dealt with the concept of information marketing, which is almost completely ignored in the GCC countries. The other issue related to new possibilities for exploiting recent developments in information technology as an effective means of information processing and dissemination.

Aside from basic information technology, such as the production of simple indexes and union lists and printing of bibliographies and catalogues, many individuals stressed the need to build local databases appropriate to indigenous needs. The databases, whether developed by government and /or the private sector, would serve specific purposes, such as bibliographic and information retrieval, inter-library loan and resource sharing, and the like. While some individuals believed that only Saudi Arabia now maintains a growing technical and human base for developing indigenous information technology, others doubted that the country has such a base and in other countries the situation is quite variable, unfortunately due to lack of planning.

Most respondents agreed that the tradition of using information resources is not well developed in the GCC, and that the skills and knowledge of those using information to solve specific problems are low. This causes under-utilisation of information systems and services available in the country. A third major concern dealt with the promotion and marketing of information services and products. It was quite evident to many interviewees that lack of methods of information marketing, including market research, limits information utilisation. Some individuals suggested that GCC information resources and information professionals should have well established public relations programmes, which would contribute to increased information use.

Regardless of the GCC economic situation, all interviewees felt that certain policies related to the cost of information should be established. Some interviewees argued that introducing charges to users might lead to a social division of information rich and information poor. Some information resources administrators argued that charging fees to individual users might result in resistance on the part of the users. Other issues associated with the cost of information included (1) whether fees contribute to the quality of information obtained, (2) whether they should be applicable to all categories of users, and (3) whether they should cover all types of information services or only specific services, such as on-line searching. Another issue raised by some information resources administrators related to whether fees obtained for services should be given to institutions providing these services. For information not available from the information resources, turned to personal contacts, the originator and contractors. Almost three-quarters of the respondents said they could not get the information they needed from the information resources - particularly engineers in universities and research institutes. But one has to understand the kind of information required by staff before judging the information resources.

Most issues regarding information utilisation related to users. It was quite evident to many individuals that information users constitute the weakest area as far as information use is concerned for with closed-door policy and self-centred information providers are responsible unfortunately ignoring community needs. Most respondents agreed that the tradition of using information resources is not well developed in the GCC, and that the skills and knowledge of those using information to solve specific problems are low. This causes under-utilisation of information systems and services available in the country. A third major concern dealt with the promotion and marketing of information services and products which does not exist in the GCC. It was quite evident to many interviewees that lack of methods of information

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## CONCLUSIONS AND RECOMMENDATIONS

In the absence of a national information network the users needs cannot be fulfilled satisfactorily, however, the low usage in always a deterrent against the information systems development. The establishment of a scientific and technological information system is based on the presumption that there must be a number of scientists, engineers, technologists, etc., to use the services.

It is recommended that the main functions of GCC information systems should be for the documentation and information work consisting of scanning the material published anywhere and in any language picking out the useful material and listing them in an orderly manner for the benefit of scholars and users. The information work consists of evaluation, analysis of documents and provision of state of the art reports and automation, etc. To compile indices on subjects related to research and development in science and technology providing the nature of information contained in various documents.

In order to provide effective and efficient information provision it is suggested that the most efficient means of acquiring processing and disseminating information should include on national and regional level:

1. Identification and study of the information needs of users;
2. Establishment of a national science information resources that can cover comprehensive materials available only at the national, regional and international level;
3. Identification of international information centres, associations, societies, publishers marketing investigation industries and other sources in order to access comprehensive technical information; marketing investigation industries and other sources in order to access comprehensive technical information;
4. Provisions to users of access points by using new information technology;
5. Provision of an efficient information storage and retrieval system;

6. Computerisation of information systems for the distribution of information;
7. Creation for distributors of various information channels such as NTIS, JICST and BLDSC through the use of new information technology;
8. Provision of information from foreign databases with translated abstracts in Arabic, and translation of GCC databases into English to make possible an international information exchange;
9. Qualitative improvement in the efficiency of databases produced by several GCC information centres;
10. Delegation of responsibility to a central information agency for developing databases produced in GCC and creating a GCC thesaurus in several fields, instead of delegating these roles to various information entities;
11. Training of information professionals with a strong subject background in the areas of science and technology, to be involved in managing information flow, specifically in developing a GCC thesaurus in specialised areas, standardising vocabulary, indexing and abstracting;
12. Planning by the policy makers at a national level of an information network, electronic information resources so that information can be accessible on computers;
13. Interfacing the scientific and technical information network with a national computerised education and research network, one of national networks;
14. 14 A major role for the government in developing and updating information retrieval languages in the areas of specialised science and technology;
15. Co-ordination of acquisition and cataloguing among specialised information centres under the co-ordination of national information agency;
16. Improving the GSTIN information handling activities through;
17. GSTIN location under GCC for the control and co-ordination of scientific and technical information activities;
18. Development by GSTIN of a variety of information sources and provision of services efficiently.

GCC countries through co-operation, would become more effective and competitive in scientific and technological achievement. Institutional structures for science and technology for the entire GCC would then become feasible so as to co-ordinate the efforts of the regional institutions towards a common and sustained GCC action.

The GCC countries should consider establishing within the family of the GCC: a GSTIN (Gulf Science and Technology Information Network) which could be the nucleus of a common GCC institutional network.

Currently, the actual collection of information resources in the GCC is done by various information agencies which, according to one senior official, is not harmonised so as to form the information elements needed for national development. This problem may be closely associated with the lack of a planned and organised effort to co-ordinate the functions of various information agencies. One possible way to ensure such co-ordination is to designate an appropriate agency for co-ordinating information activities, including information collection for various agencies functioning in many priority sectors. Several issues concerning information accessibility were raised during the interview. One aspect of information accessibility related to the services required organising information. While many individuals considered the private sector to have a positive contribution to develop added-value information services and products, others believed that the quantity of information generated within most of the GCC countries was not sufficient to warrant such involvement. Some others also believe that since government regulates and controls information flow, private sector involvement in information field may be blocked. However several companies from private sectors like Dabbagh Technology, Arabian Advanced System and EDUTECH etc are doing a wonderful job as information broker for information provision in the GCC countries. Despite this situation, some information resources administrators emphasised the private sector's role in acting as an information broker in the country, while government information agencies can continue carrying out other added-value information services and products (e.g., indexing and abstracting services).

The structure of information distribution and dissemination services is inadequate due to the lack of effective distribution and dissemination mechanism in most of the GCC country. There seems to be a geographical distance between the products and services of systems and potential users even in smaller countries like Bahrain and Qatar. This problem in fact raised two issues. One dealt with the concept of information marketing, which is almost completely ignored in the GCC countries. The other issue related to new possibilities for exploiting recent developments in information technology as an effective means of information processing and dissemination.

The perceptions of science information resources users are essential to this process of "rethinking" and change. It is important to know who the users are, what their information needs are, and how they feel about the information resource's services and its collection, including both printed and electronic information resources.

At national level all the GCC countries should:

i. Formulate and implement science and technology policies, taking into account national social and economic goals.
ii. Develop national research capabilities technology research parks, facilities, and the necessary infrastructure.
iii. Undertake and support specific research programmes in areas important to national social and economic development objectives.
iv. Organise and support joint international/national research programmes.
v. Create and manage a system of national research laboratories to focus on applied research of unique interest and need.
vi. Establish and maintain a scientific and technical manpower information system as an aid to science planning and effective use of scientific and technical personnel.
vii. Organise, operate or sponsor effective science information institutions and activities, including international conferences, symposia, and research publications that will be useful in achieving the objectives, e.g. one being held today by HCT in Abu Dhabi.
viii. Co-operate with universities, laboratories, and other research centres to encourage research exchange knowledge and experience, and avoid duplications of effort.

Disconnected from the social and historical roots of technological progress, technology transfer is embraced on a global level as a tangible solution to the third-world development problem. Left under-scrutinised is the dehumanising potential of using technological progress as a gauge for civilisation advancement. In the GCC context increasing globalisation of the link between progress and technology is demonstrated, which has accelerated its modernisation efforts in the last 10 years. On one hand, alternative models are required for envisioning social and environmental sustainability; on the other hand, strategies for intervention are needed to overcome deep-seated ideological beliefs about progress. Education represents a key site for producing and shaping ideological beliefs.

Based on any analysis of training systems and strategies world-wide, countries in different circumstances and at different stages of development can use training to increase their national competitiveness, improve the efficiency of their enterprises and promote employment growth all necessary for national development.

It would be more beneficial for all the major R & D institutes like KISR, KACST, GOIC, Research Institute (KFUPM) and CERT to form a consortium to avoid duplication and share knowledge management for national and regional development.

The next challenge will involve the evolution of new individual and organisational social behaviour and norms that will enable us to live and work within all of the new and dynamically changing connections. Social forms that will allow for truly interdependent activities in areas such as global shopping, entertainment, education, and telecommuting have yet to emerge. Our students, who will spend most of their working lives in the 21st century, will come to perceive the computer and its related information technologies as extensions of themselves-simple tools much like paper and pencil, the abacus, the slide rule, and the calculator. The promise is that IT will enable us to enhance our ability to synthesise ideas, to gain greater insights into complex applications of basic productivity tools. The major challenge for all educators will be to remain open and humble enough to realise that we are no longer able to teach in the traditional sense of the word. We must break old educational paradigms, provide the resource and wisdom basics, and to act as guides for our students as we all learn together for national, regional and international development.

## REFERENCES

- Algola, S.S., (1993). *Scientific and technical information transfer: promoting information on acquisition in the Saudi Arabian industrial sector.* Unpublished doctoral dissertation, Indiana University.
- Bush, C.L., (1981). *Taking hold of technology: topic guide for 1981-1983.* Washington, DC: American Association of University Women. P.1
- Davis, G.B., (1992). "A model for adoption and diffusion of information systems in developed countries" In Palvia, S., Palvia, P. And Zigli, R. (Eds), *Global Issues of Information Technology Management*, Idea Group Publishing, Harrisburg, PA
- Gray, J., (1993). *Towards a Framework for a National Information Policy*: Discussion paper for LISC(E) Meeting held at the Department of National Heritage on 4 November 1993. London: Rosemary Gray Associates.
- Hall, E.T. and Hall, M.R., (1990). *Understanding Cultural Differences*, Intercultural Press, Yarmouth, ME.

- Hill, M.W., (1994). *National information policies and stratageies: overview and bibliographical survey*. Bowker-Saur.
- Kader, A. (1990). *Co-ordination between Acquisition & Serials Departments at King Saud University (report)*, King Saud University.
- Kader, A., (1995). *Manpower development for scientific & technical information in Kuwait (report)*, KIISR, Kuwait.
- Kader, A., (1997). *Research & Development in Science and Technology in GCC countries: role of Information Centres and Libraries*. Unpublished doctoral dissertation, Loughborough University.
- Kader,A. (1999). *Training of LRC Staff in Oman (report) Ministry of Higher Education*, Oman
- Kader, A., (2000). "The transition of information transfer into information services in the GCC countries for the 21st century: a case study." In *International Information Services* ed. by J.F. Harvey. (In Press)
- Kaye, R. And Little, S.E., (1996). "Global business and cross-cultural information systems: technical and institutional dimensions of diffusion" , *Information Technology & People*, v. 9 no.3, pp. 30-54
- Montviloff, V., (1990). *National information policies*. Paris: UNESCO.
- O'Hare-Devereaux, M. and Johansen, R., (1994). *Globalwork: Bridging Distance*, Culture and Time, Jossey-Bass, San Francisco, CA.
- Trigo. M.J.A., A.M.R. Correia and T. Wilson, (1996). *Brief communication national information policy: the Portuguese legal framework* (1980-1992). Journal Information Science, 22(3), 219-227.
- UNESCO, (1985). *Promotion of information technology applications in third world countries: PGI's role*. Paris: UNESCO.
- Wilson, T.D., (1990). *Information management I*. University of Sheffield, Department of Information Studies.